The PHOTOFACT Servicer

SET 421 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★NOV. 15, 1958

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The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

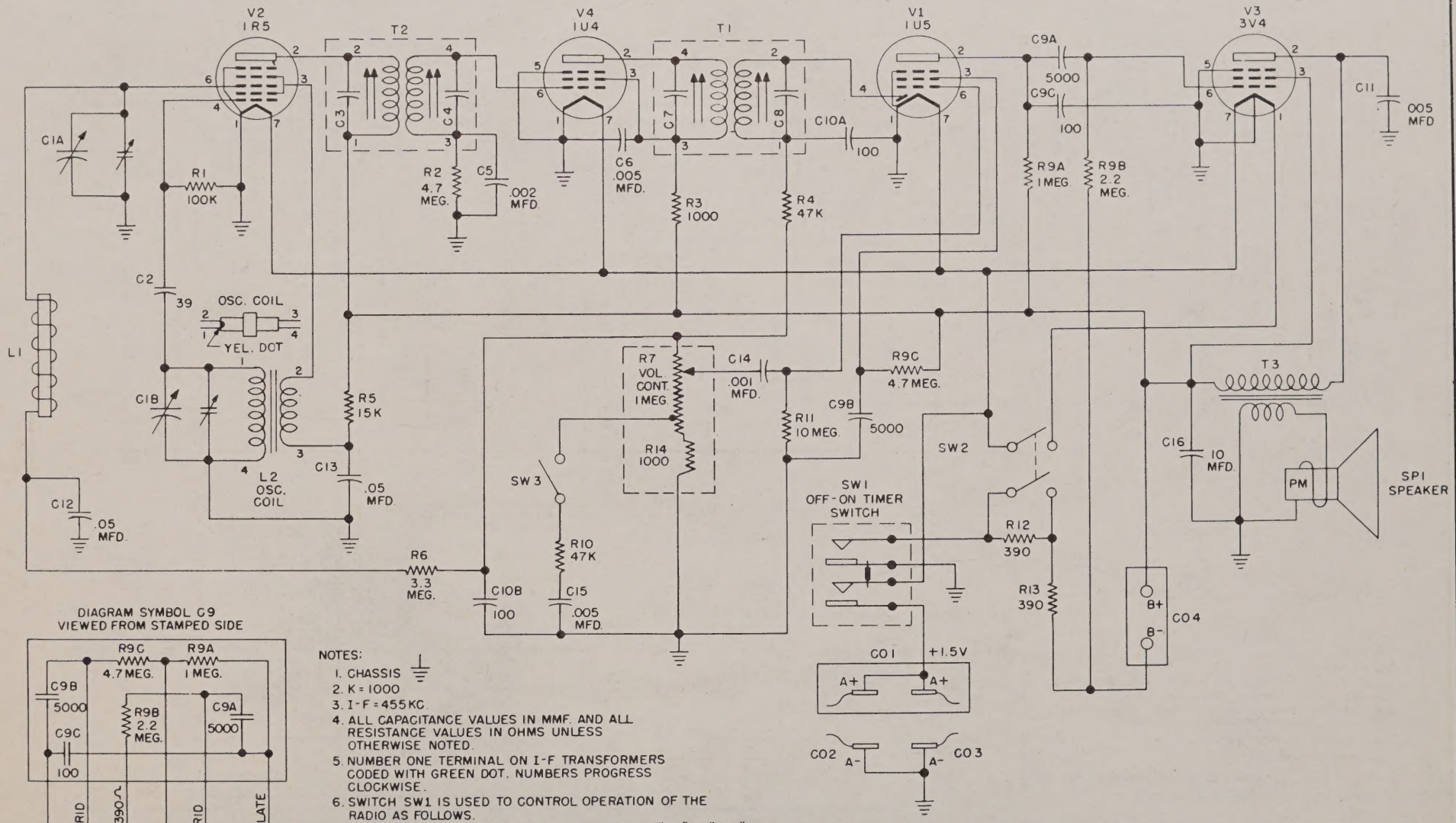
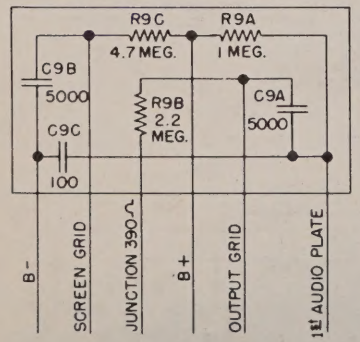


DIAGRAM SYMBOL G9
VIEWED FROM STAMPED SIDE



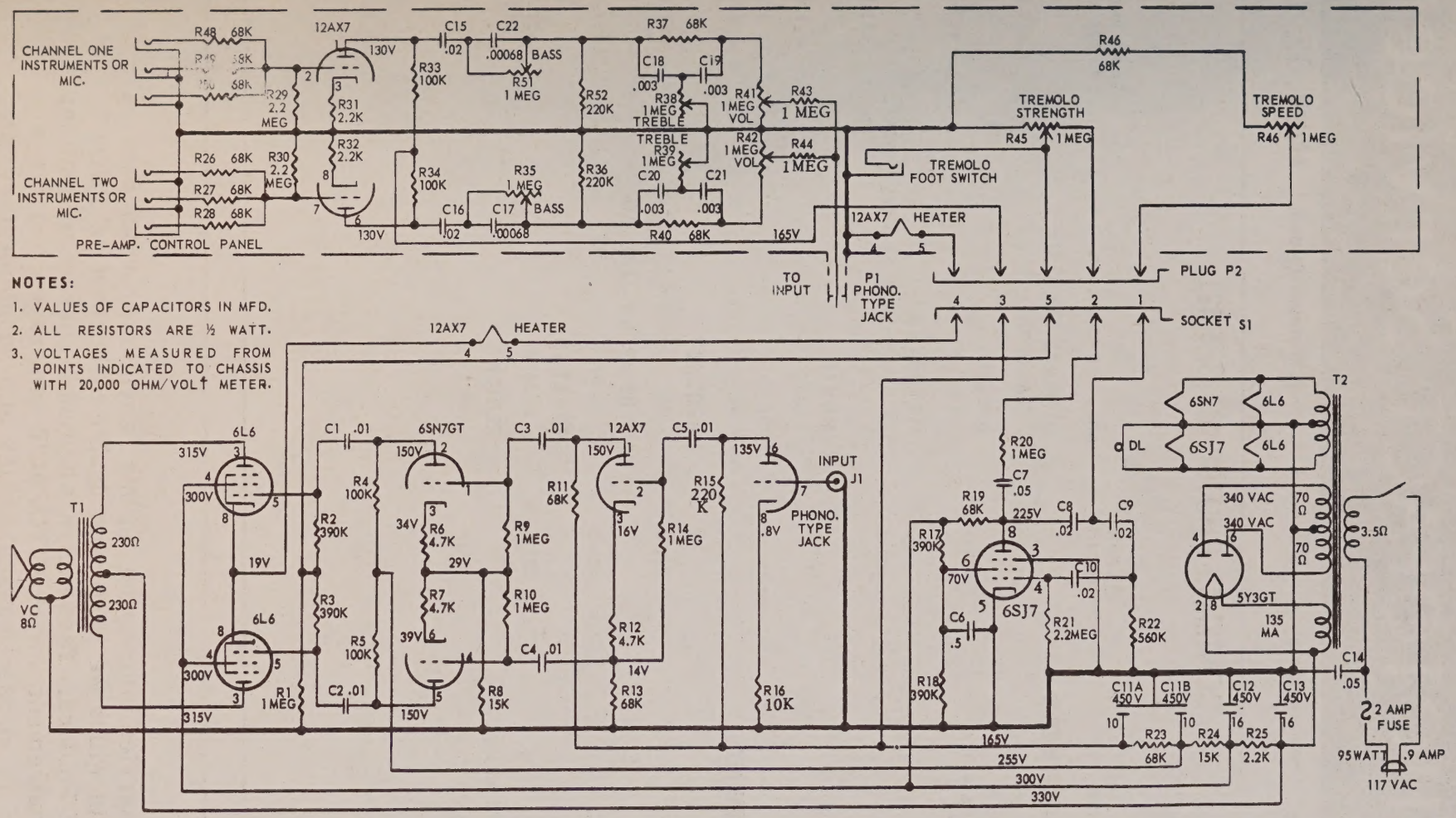
NOTES:

1. CHASSIS
2. K = 1000
3. I-F = 455 KC.
4. ALL CAPACITANCE VALUES IN MMF. AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE NOTED.
5. NUMBER ONE TERMINAL ON I-F TRANSFORMERS CODED WITH GREEN DOT. NUMBERS PROGRESS CLOCKWISE.
6. SWITCH SW1 IS USED TO CONTROL OPERATION OF THE RADIO AS FOLLOWS.
   (A) MANUALLY BY SETTING THE SWITCH KNOB AT "ON" OR "OFF". (SWITCH SHOWN IN "OFF" POSITION).
   (B) AUTOMATIC ALARM AND RADIO START (POWER ON). BY PRESET OF ALARM CONTROLS WITH THE SWITCH KNOB SET AT "AUTO".
   (C) AUTOMATIC STOP (POWER OFF) AFTER NOT MORE THAN A 60 MINUTE INTERVAL BY SETTING THE SLEEP CONTROL WITHIN THE SLEEP SECTION.
7. SW2 SHOWN IN "MAXIMUM BATTERY LIFE" POSITION.

CROSLEY MODELS F-100BE, BK, CE, GN, RD,

(CH. 100F)

SCHEMATIC DIAGRAM COURTESY CROSLEY DIV. AVCO MFG. CORP.

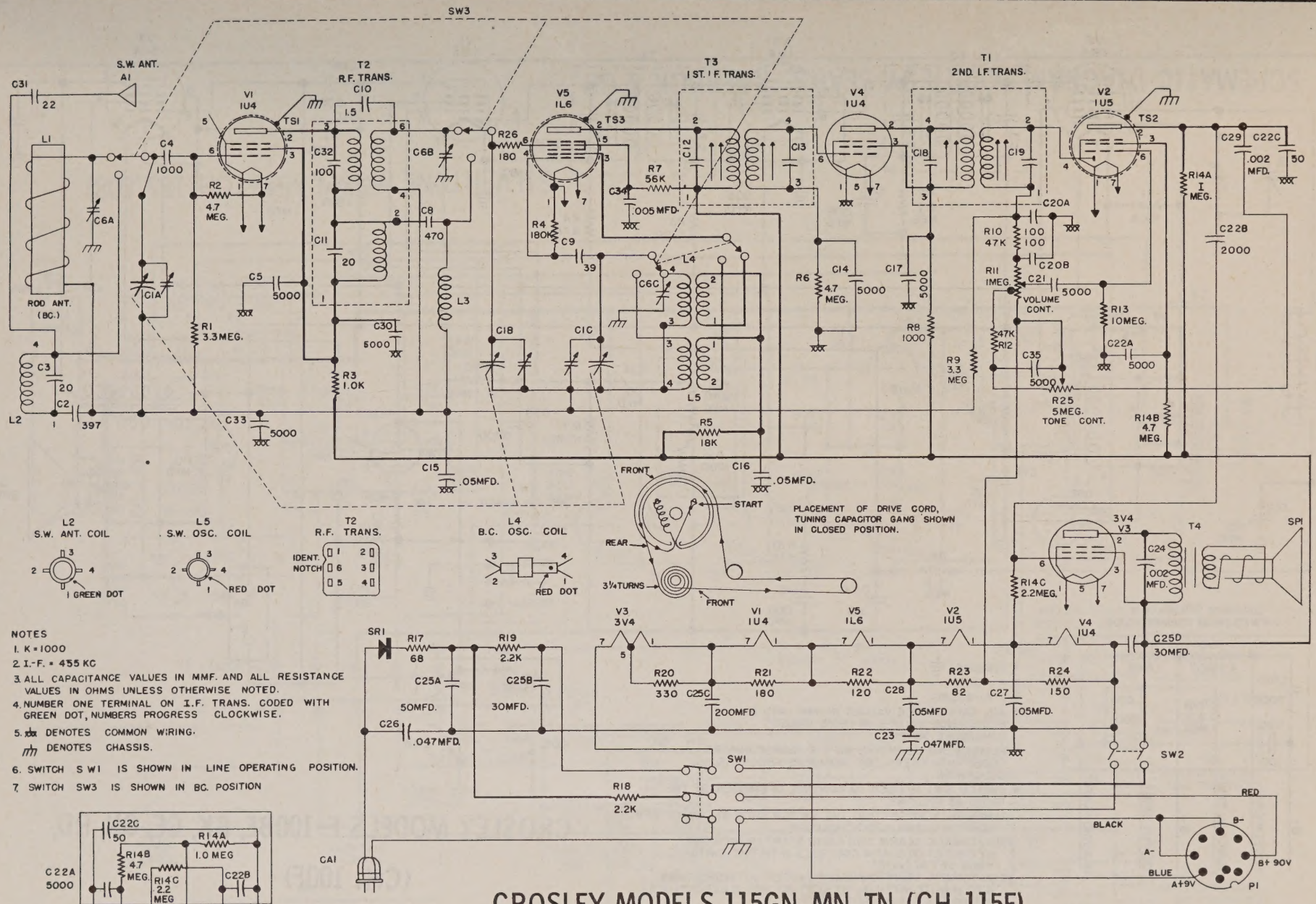


NOTES:

1. VALUES OF CAPACITORS IN MFD.
2. ALL RESISTORS ARE ½ WATT.
3. VOLTAGES MEASURED FROM POINTS INDICATED TO CHASSIS WITH 20,000 OHM/VOLT METER.

SILVERTONE MODEL 1335 (CH.185.808)

SCHEMATIC DIAGRAM COURTESY SEARS, ROEBUCK & CO.



NOTES

1. K = 1000
2. I.-F. = 455 KC
3. ALL CAPACITANCE VALUES IN MMF. AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE NOTED.
4. NUMBER ONE TERMINAL ON I.F. TRANS. CODED WITH GREEN DOT, NUMBERS PROGRESS CLOCKWISE.
5. xxx DENOTES COMMON WIRING.
   ⏚ DENOTES CHASSIS.
6. SWITCH S W1 IS SHOWN IN LINE OPERATING POSITION.
7. SWITCH SW3 IS SHOWN IN BC. POSITION

CROSLEY MODELS 115GN, MN, TN, (CH. 115F)

SCHEMATIC DIAGRAM COURTESY CROSLEY DIV. AVCO MFG. CORP.

PHOTOFACT* Folder

with CIRCUITRACE*

AIRLINE MODELS
GTM-4202A, GTM-4302A

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

AIRLINE MODELS
GTM-4202A, GTM-4302A

MODEL GTM-4302A

AIRLINE MODELS
GTM-4202A, GTM-4302A

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SET 421 FOLDER 1

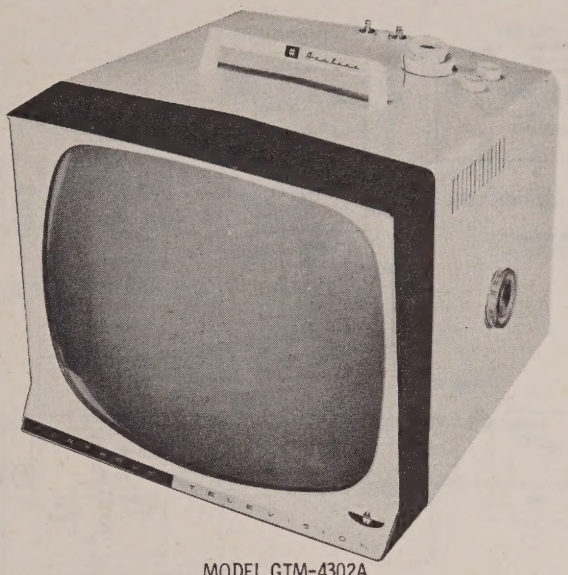
AIRLINE MODELS GTM-4202A, GTM-4302A

AIRLINE MODELS GTM-4202A, GTM-4302A

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Pull the 4 top and 2 side knobs out approximately 1" to disengage from the control shafts. (Knobs cannot be removed.)
2. Remove 7 metal screws holding rear cover. Remove rear cover.
3. Remove the 2 snap-in buttons holding antenna terminal board.
4. Remove nylon bushing between telescoping antenna arms.
5. Remove picture tube socket, speaker leads, HV lead, yoke clamp and yoke.
6. Remove 2 hex nuts holding speaker. Remove speaker.
7. Remove 2 metal screws holding chassis at the top.
8. Remove 4 bottom metal chassis screws.
9. Remove chassis from rear of chassis.



MODEL GTM-4302A

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

TRADE NAME	Airline MODELS GTM-4202A, GTM-4302A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Avenue, Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 110 Watts, 1.14 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

AIRLINE MODELS GTM-4202A, GTM-4302A

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the rear cover, and supplying power to the receiver. Set the Fine Tuning at the center of its range The adjustments are accessible, one at a time, thru a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws (bottom front) holding front to cabinet.
Remove front by pulling out at the bottom and up.

FOCUS

No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Multivibrator it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B2) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE DEVICE

A 7.5Ω fusible resistor (R75) is used for low voltage power supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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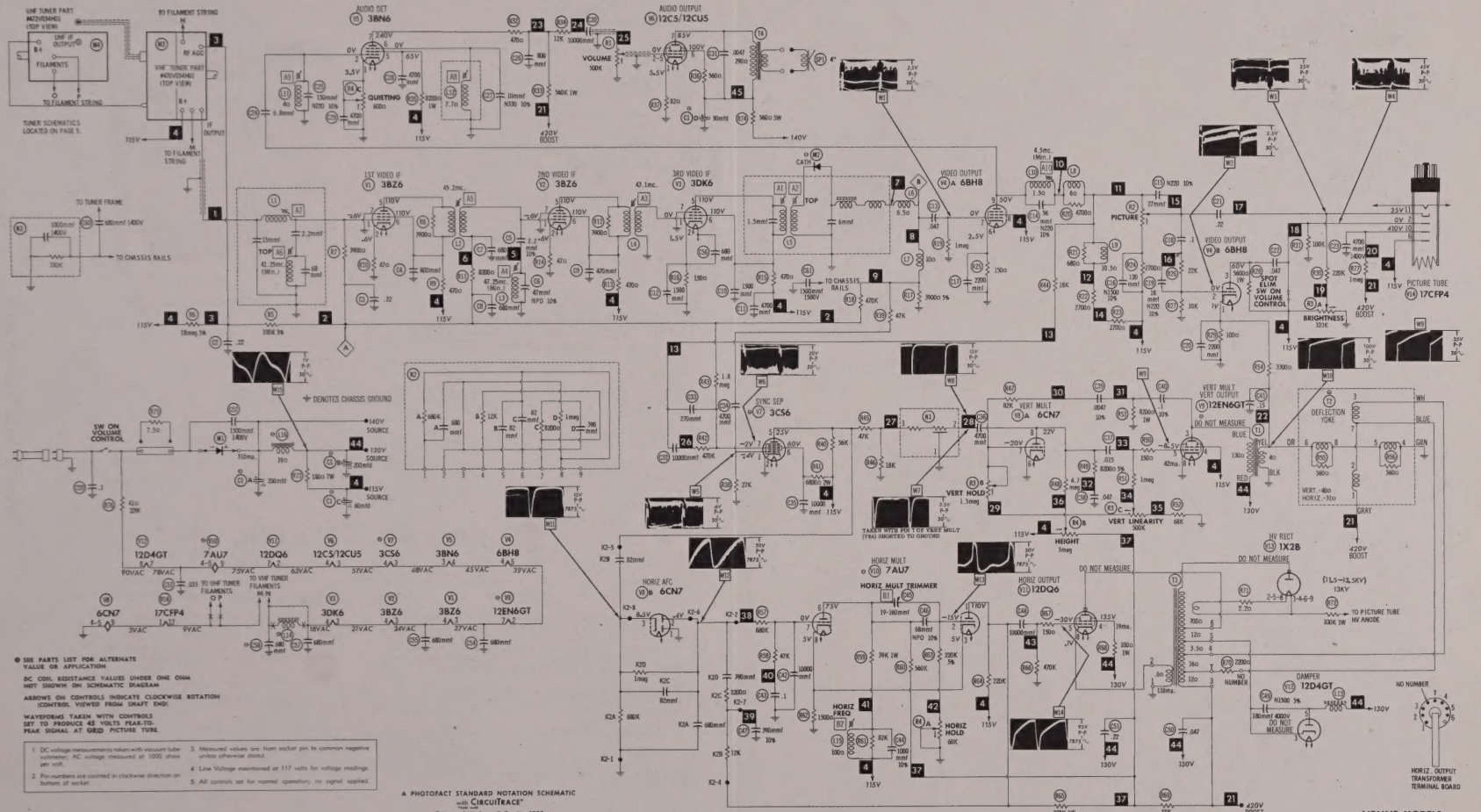

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 45 VOLTS PEAK-TO-PEAK SIGNAL AT GRID PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE™

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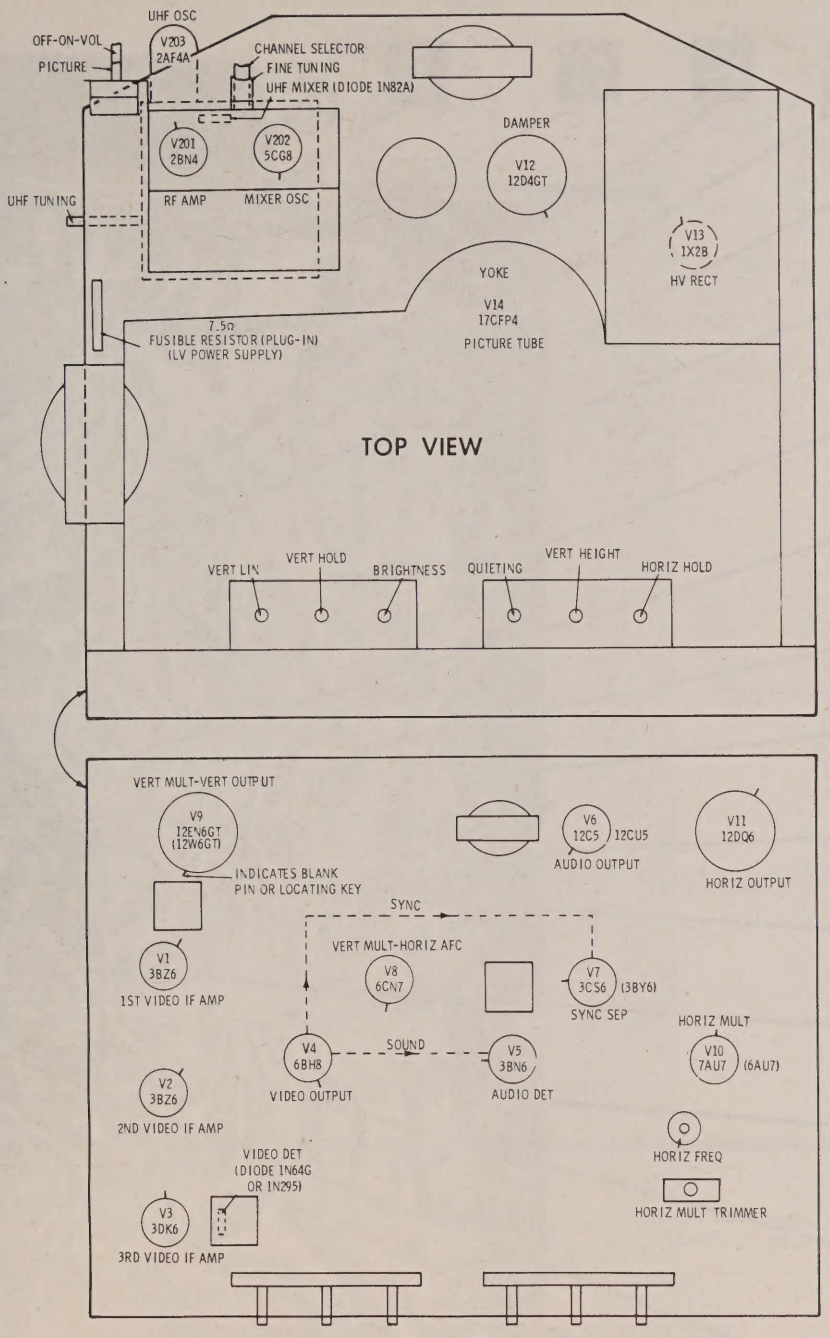
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

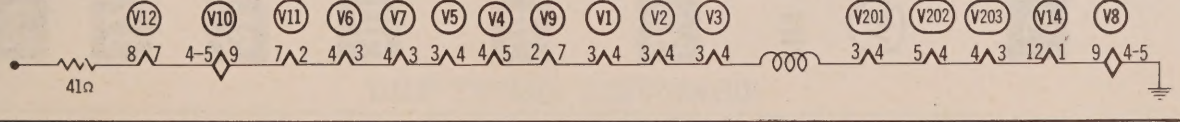
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (R75), Rectifier (M1)

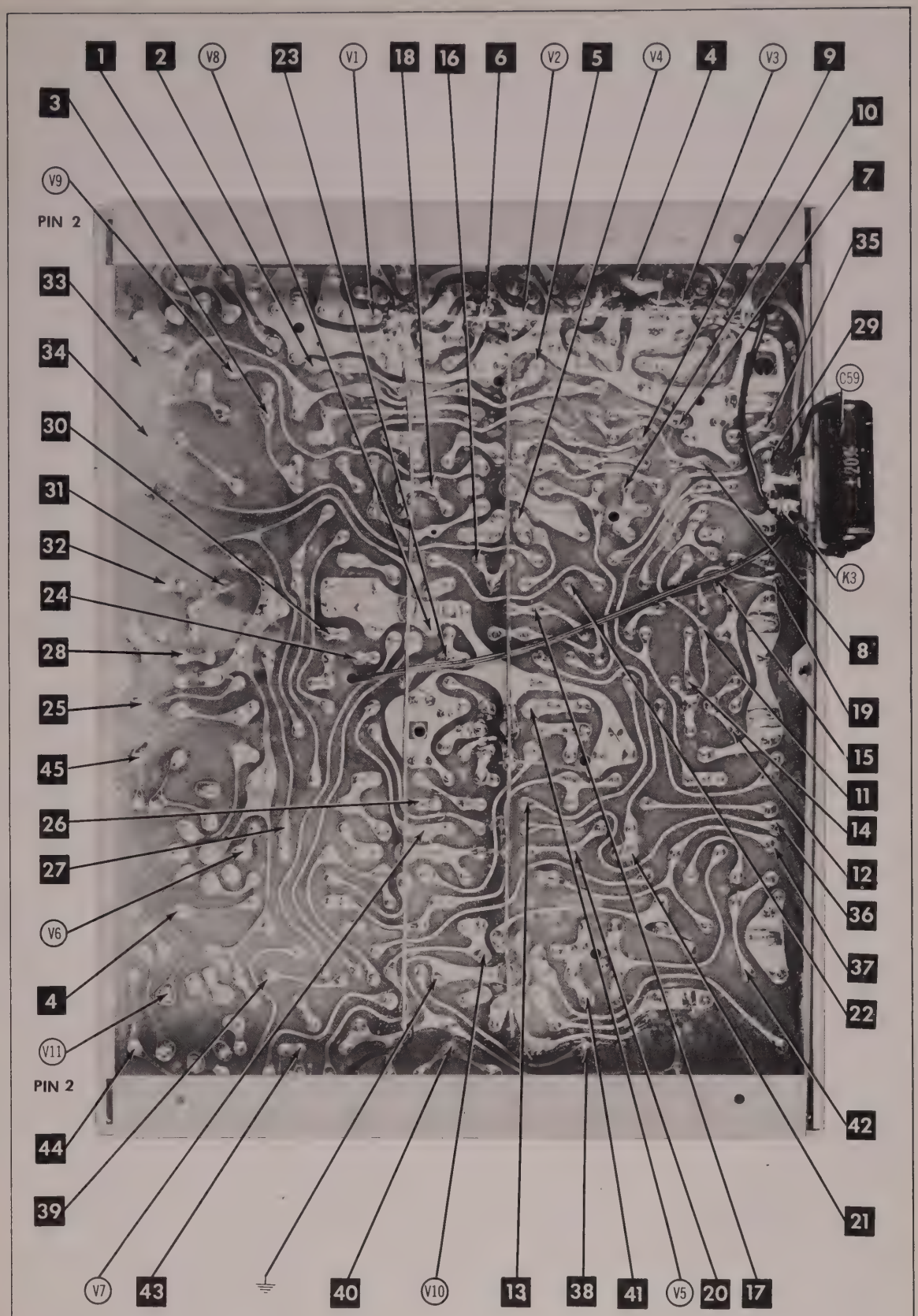
SWEEP FAILURE
No raster, has sound V8, V10, V11, V12, V13, V14
No vertical deflection V8, V9
Poor vert. linearity or foldover V8, V9
Poor horiz. linearity or foldover V10, V11, V12
Narrow picture V10, V11, V12, M1
Vert. off freq. V8, V9
Horiz. off freq. V10

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (M2), V4
No pic, no sound, has snow V201, V202, V1 (V203 UHF)
No pic, has sound, has raster V4, V14
Has pic, no sound V5, V6

SYNC FAILURE
No vert. sync V7
No horiz. sync V7, V8
No vert. or horiz. sync V7

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



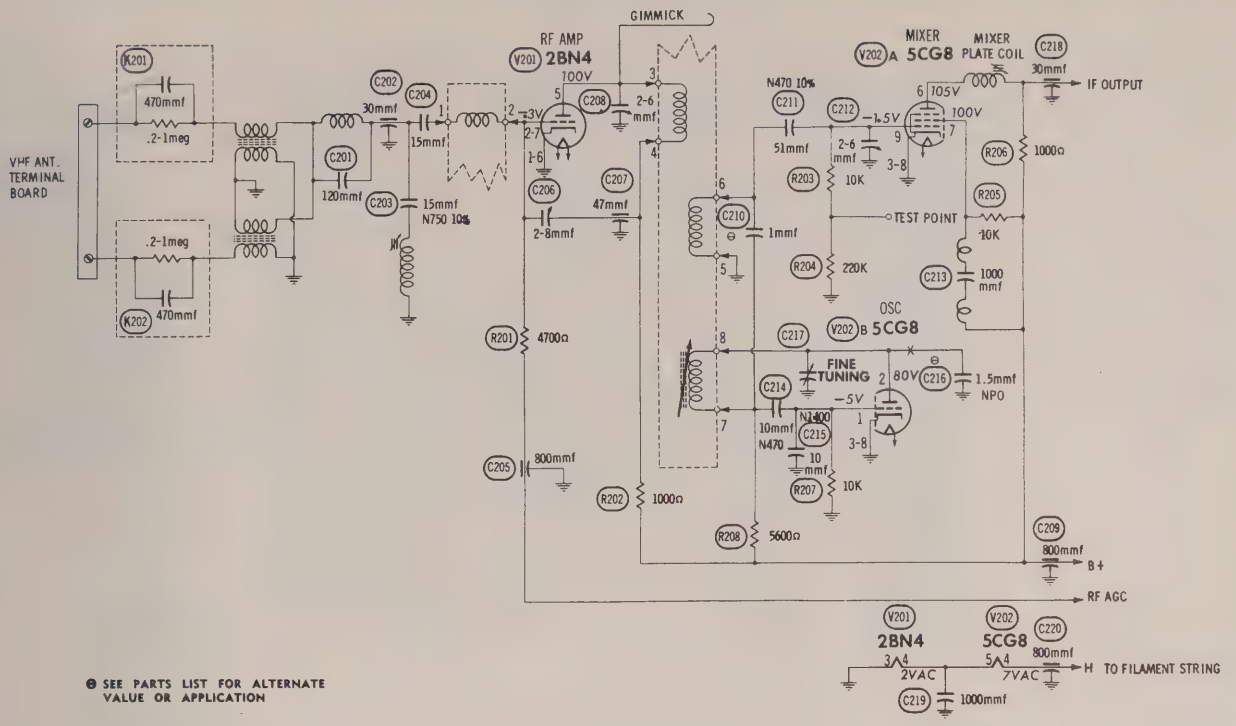


A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

AIRLINE MODELS
GTM-4202A, GTM-4302A



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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A PHOTOFACT STANDARD NOTATION SCHEMATIC
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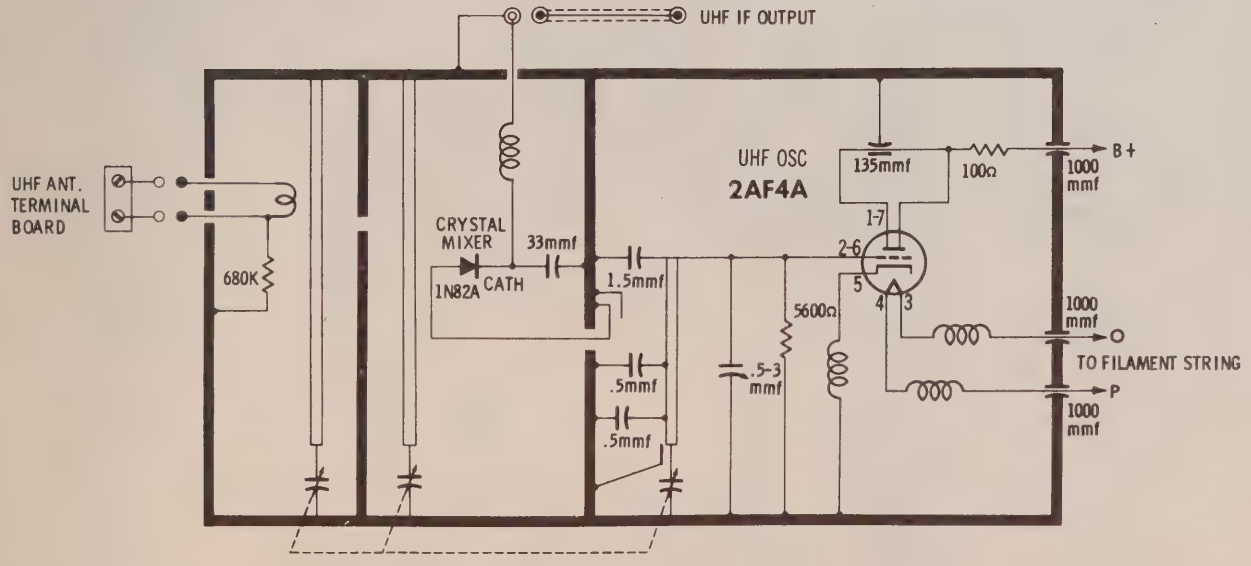
VHF TUNER 470V053H01 & VHF TUNER W/UHF PROVISIONS 470V054H01



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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UHF TUNER 472V034H01

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point (T) . Positive to chassis.
Temporarily detune the Mixer Plate Coil to remove "Kick back" from response.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC	205.25MC 209.75MC	12	Vert. Amp. thru 10K to point (U) . Low side to chassis.	A201, A202	Adjust for response curve similar to Fig.201 with markers above 90%.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A203	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A204	
			201MC	199.25MC 203.75MC	11		A205	
			195MC	193.25MC 197.75MC	10		A206	
			189MC	187.25MC 191.75MC	9		A207	
			183MC	181.25MC 185.75MC	8		A208	
			177MC	175.25MC 179.75MC	7		A209	
			85MC	83.25MC 87.75MC	6		A210	
			79MC	77.25MC 81.75MC	5		A211	
			69MC	67.25MC 71.75MC	4		A212	
			63MC	61.25MC 65.75MC	3		A213	
			57MC	55.25MC 59.75MC	2		A214	

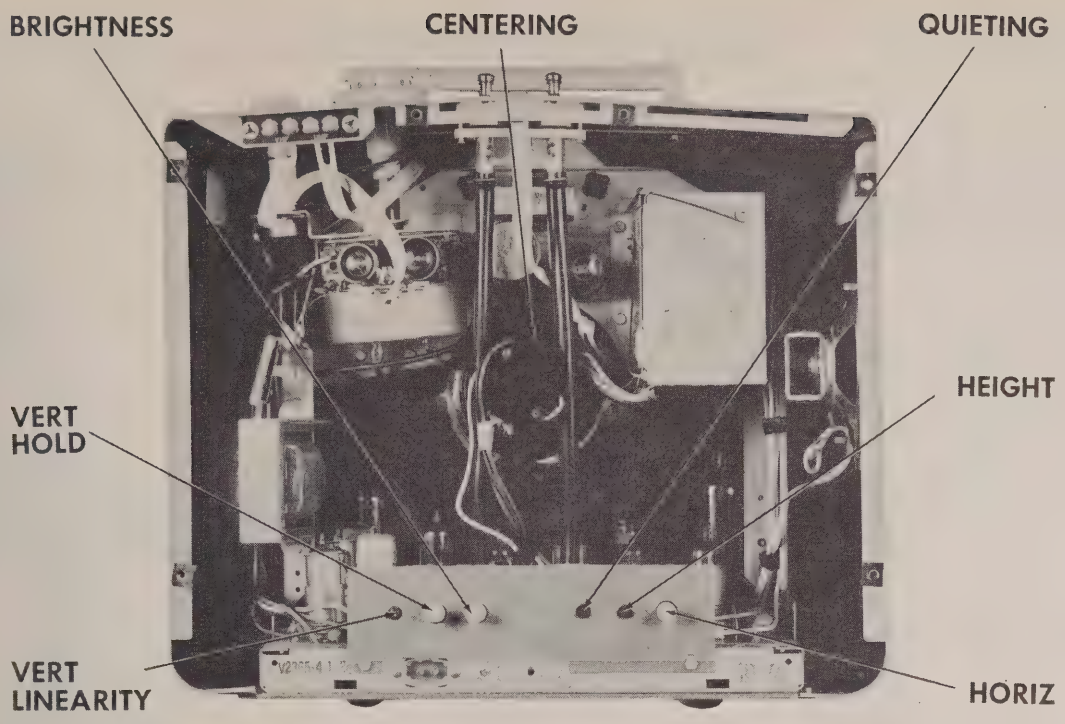
VHF OSCILLATOR ALIGNMENT

Set the Fine Tuning at the center of its range. The adjustments are accessible, one at a time, thru a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

UHF TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

FIG. 201



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a clip lead across the Horizontal Frequency coil (L15). This may be done from the top of the chassis.

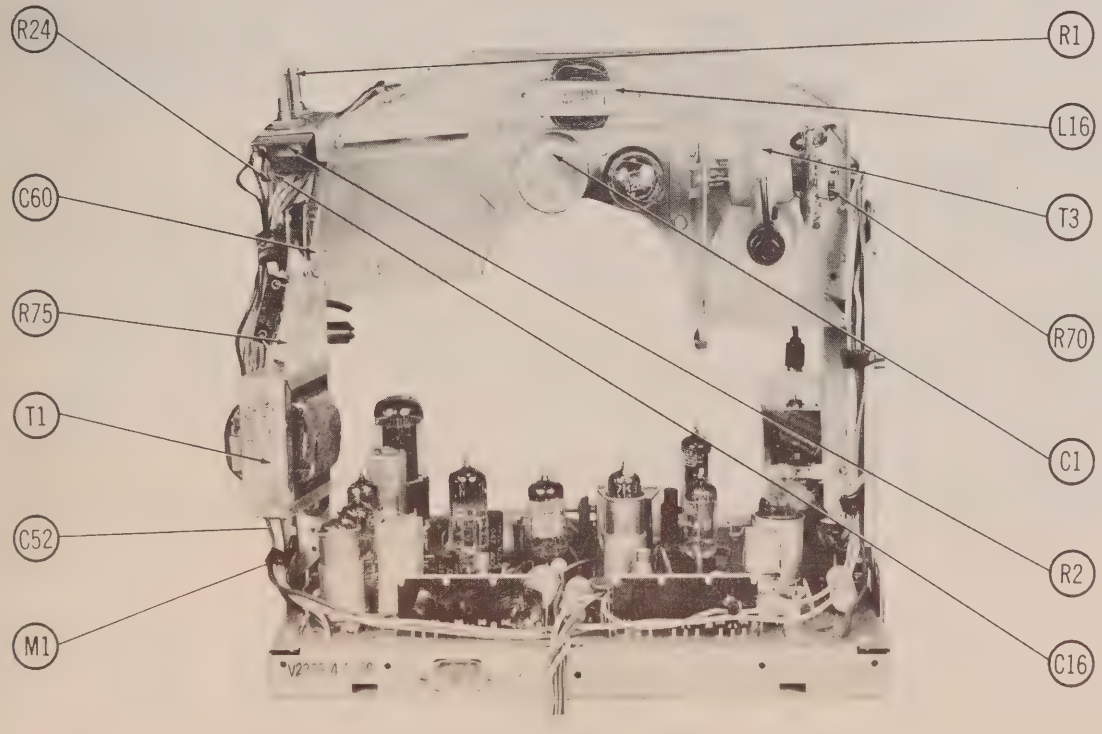
Set the Horizontal Hold (R4A) to the center of its range.

Connect the DC probe of the VTVM to pin 7 (grid) of Horizontal Multivibrator (V10). Common to chassis.

With the receiver tuned to a TV signal, adjust the Horizontal Multivibrator Trimmer (B1) for zero reading on the VTVM. If zero can be approached, but not quite reached at one extreme of B1, it may be necessary to set the Horizontal Hold SLIGHTLY to one side of mid-range to obtain zero reading on the VTVM.

Remove the clip lead from L15.

Adjust the Horizontal Frequency slug (B2) for zero reading on the VTVM and check the adjustment by switching off channel and back again. The receiver should pull into synchronization on all channels. If not, repeat adjustments.



CHASSIS—REAR VIEW

SET 421 FOLDER 1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools ..... General Cement #8282 or 8606
Walsco #2543

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ. Positive to chassis.
Preset A7 fully counterclockwise.
Connect a 470mmf capacitor across the input leads of the scope and VTVM.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of 3rd. Video IF Amp. (V3). Low side to chassis	44.0MC (10MC Swp)	43.9MC	Any non-interfering channel	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis. (Across Video Det. load)	A1, A2	Preset Mixer Plate coil by turning slug fully counterclockwise. Adjust A1 for maximum deflection. Adjust A2 for correct tilt.
2.	" "	High side to pin 1 (grid) of 1st. Video IF Amp. (V1). Low side to chassis.	Not used	43.1MC	"	USE VTVM. DC probe thru 47K to point Ⓑ. Common to chassis. (Across Video Det. load)	A3	Adjust for maximum deflection.
3.	"	"	"	47.25MC	"	"	A4	Adjust for MINIMUM deflection.
4.	"	"	"	45.2MC	"	"	A5	Adjust for maximum deflection.
5.	"	"	44.0MC (10MC Swp)	41.25MC 42.25MC 43.0MC 44.0MC 45.0MC 45.75MC 47.25MC	"	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis. (Across Video Det. load)		Retouch A1, A2, A3 and A5, if necessary for response similar to Fig. 1. NOTE: If excessive tilt is present adjust A1 and A2 to 44.5MC.
6.	Direct	High side to ungrounded tube shield floating over Mixer Osc. tube (V202). Low side to chassis.	Not used	41.25MC	"	USE VTVM. DC probe thru 47K to point Ⓑ. Common to chassis. (Across Video Det. load)	A6	Adjust for MINIMUM deflection.
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	"	59.75MC	2	"	Fine Tuning	"
8.	"	"	57MC	55.25MC 59.75MC	"	Vert. Amp. thru 47K to point Ⓑ. Low side to chassis. (Across Video Det. load)	A7, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Adjust Mixer Plate Coil for maximum gain and A7 for proper tilt.

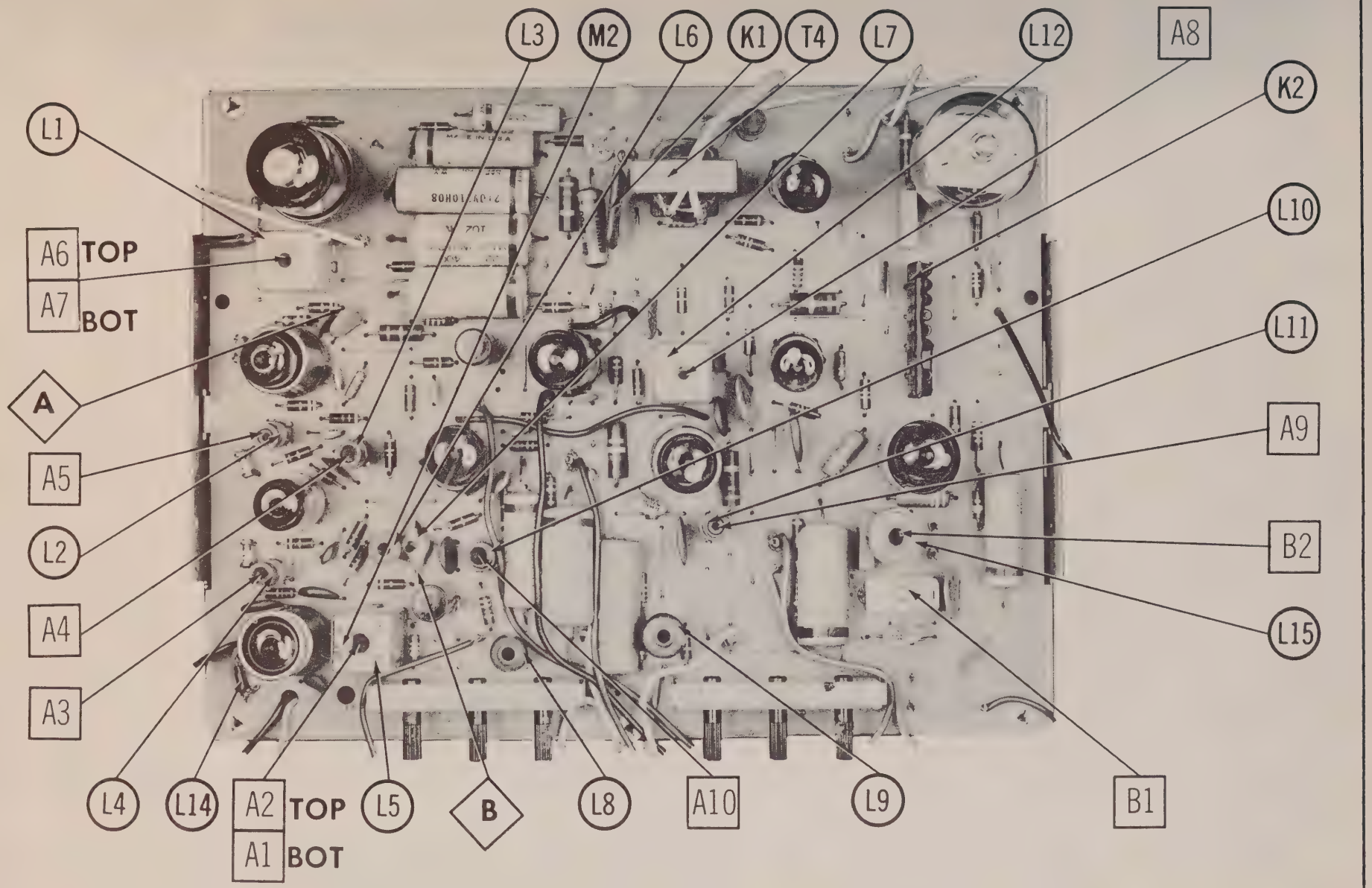
4.5MC Trap Alignment

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001mfd	High side to point Ⓑ. Low side to chassis.	4.5MC (30% AM)	Any non-interfering channel	AC probe to pin 11 (cathode) of picture tube. Common to chassis.	A10	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Connect the DC probe of a VTVM thru 4.5MC detector probe (Fig. 3) to pin 2 (grid) of the Audio Detector (V5). Common to chassis.
Tune in the strongest TV signal available and set the Quieting Control (R4C) to the center of its range.
Set the Volume at a low level and adjust A8 for maximum volume.
Reduce the signal strength at the antenna. Use either loose coupling or an attenuator pad at the antenna terminals. Adjust A9 for maximum negative voltage on the VTVM.
Reduce the volume to a low sound level and attenuate the signal at the antenna terminals until a negative reading of 1 volt is obtained on the VTVM.
Readjust A8 for maximum volume.
Select the strongest TV signal available and turn the Fine Tuning away from best picture to the point where -1.5 volts is obtained on the VTVM. (It may be necessary to misadjust the tuner oscillator slug to accomplish this. If so, be sure to readjust Oscillator when finished.) Adjust the Quieting control for MINIMUM buzz.

CONTINUED PAGE 13.



INDUCTOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	1st Video IF Amp	3DF26	
V2	2nd Video IF Amp	3DF26	
V3	3rd Video IF Amp	3DK6	
V4	Video Output/Video Output	6BH8	
V5	Audio Det	3BN6	
V6	Audio Output	12C5	
		12CU5	

ITEM No.	USE	TYPE	NOTES
V7	Sync Sep	3CB6	3BY6 *
V8	Vert Mult -Horiz. AFC	6CN7	
V9	Vert. Mult.-Vert. Output	12EN5GT	12W6GT *
V10	Horiz Mult	7AU7	6AU7 *
V11	Horiz Output	12DQ6	
V12	Damper	12D4GT	
V13	HV Rect.	1X2B	

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: AIRLINE PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	NOTES
V14	17CFP4			17CFP4 ①	① "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	4-200	175	24V018H02 ①	AFH54-01-55	XD0015				TVLS-4450
B	4-200	175							
C	150	175							
D	30	175							

① Alternate Part #24V018H01

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.22	600		P488N-22		CUB4P22	GEM-6022	47M-S22	
C3	.22	600		P488N-22		CUB4P22	GEM-6022	47M-S22	
C4	680			BPD-0068		L10T8		5GA-T8	
C5	3.2		V-3263-2292	MPO-BT 3.2	TCZ-3R2	CTA5Y32C	CNO-832	5TCCB-V32	10%
C7	47		21V3V300H8	MPO-BT 47	DTZ-47	CDQ47C	CNO-447	5TCC-Q47	NPO 10%
C8	680		21V5V16AH	BPD-00068	DD-68I	L10T68	B-368	5GA-T68	
C9	680		21V5V16AH	BPD-00068	DD-68I	L10T68	B-368	5GA-T68	
C10	4700		21V3V300H7	BPD-0047	DD-47I	L10T47	B-347	5GA-T47	
C10	2200		21V3V300H28	BPD-0022	DD-15J	BYA10D15	B-215	5HK-D15	
C11	4700		21V3V300H7	BPD-0047	DD-47J	BYA10D47M	B-347	5HK-D47	
C12	2200		21V3V300H28	BPD-0022	DD-15J	BYA10D15	B-215	5HK-D15	
C13	.047	600		P488N-047	DF-503	BC584U	ACE5147	48K-S47	
C14	56								N220 10%
C15	27								N220 10%
C16	120		21V3V300H43						N1500 10%
C17	2200			BPD-0022	DD-22J	BYA10D22	B-322	5HK-D22	
C18	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	47M-P1	
C19	18								N220 10%
C20	2200			BPD-0022	DD-22J	BYA10D22	B-322	5HK-D22	
C21	.22	600		P488N-22		CUB4P22	GEM-4022	47M-P22	
C22	.047	600		P488N-047	DF-503	BC584U	ACE5147	48K-S47	
C23	4700	1400	21V3V300H8	HVDS-4700	DD30-472	HVC15D47	2HV-247		
C24	6.8			MPO-BT 6.8	TCZ-6R8	L78Y68	CNO-868	5TCCB-V68	
C25	150								N220 10%
C26	680			BPD-0068	DD-68I	L10T8		5GA-T8	N330 10%
C27	10		21V3V300H44						
C28	4700			BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C29	4700			BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C30	10000		21V1U1A03	BPD-01	DD-103	BYA10D	B-310	5HK-S1	
C31	.0047	600		P488N-0047	DS-472	BC6D47J	ACE6347	68K-D47	
C32	10000			BPD-01	DD-103	BYA10D	B-310	5HK-S1	
C33	270			BPD-00027	DD-27I	L10T27	B-327	5GA-T27	
C34	4700			BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C35	10000		21V1U1A03	BPD-01	DD-103	BYA10D	B-310	5HK-S1	
C36	4700		21V3V300H54	BPD-0047	DD-472	BYA10D47M	B-347	5HK-D47	
C37	.015	600		P488N-015	DD66-153	CUB66J5	GEM-4115	47M-S15	
C38	.047	600							10%
C39	.0047	600					GEM-26347		10%
C40	.1	600							10%
C41	.15	400		P488N-15		CUB4P15	GEM-4015	47M-P15	
C42	10000			BPD-01	DD-103	BYA10D	B-110	5HK-S1	
C43	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	47M-P1	
C44	1000		21V1U1H02	1464-001		1R5D1	MCB3S5	36S-S1	10%
C45	19-180		21V7S01H01						
C46	68		21V1U5AA20	MPO-DK 68	DTZ-68	C1Q68C	CNO-468		NPO 10%
C47	330		21V1J3AH	1469-00039	MD-331	5R5T39		M9-339	10%
C48	10000		21V1U1A03	BPD-01	DD-103	BYA10D	B-110	5HK-S1	
C49	180	4000	21V3V300H30						N1500 5%
C50	.047	600		P488N-047	DF-503	CUB5S47	GEM-5147	47M-S47	
C51	.22	600		P488N-22		CUB4P22	GEM-6022	47M-P22	
C52	1500	1400	21V3V302A52	HVDS-1500	DD30-152	HVC15D15	2HV-215		
C53	.033	600		P488N-033		CUB6S33	GEM-6133	47M-S33	
C54	680		21V5V16AH	SE-680	DS-68I	L78T68	UC-5368	5GA-Q68	
C55	680		21V5V16AH	SE-680	DS-68I	L78T68	UC-5368	5GA-Q68	
C56	680		21V5V16AH	SE-680	DS-68I	L78T68	UC-5368	5GA-Q68	
C57	680		21V5V16AH	BPD-00068	DD-68I	L10T68	B-368	5GA-Q68	
C58	680		21V5V16AH	BPD-00068	DD-68I	L10T68	B-368	5GA-Q68	①
C59	.1	600		P488N-1	DF-104	CUB6P1	GEM-601	47M-P1	
C60	680	1400	21V3V04AH	HVDS-680	DD30-681	HVB15T68	2HV-368		
C61	1500	1500	21V3V302A52	HVDS-1500	DD30-152	HVC15D15	2HV-215		

① Not used in Model GTM-4202A

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	27GV043H01	B-60 Not Req.	A47-50K-2		U48 Not Req.	Volume
B	Shaft			KB-3 or KR-3	FB-3		U8-38	
C	Switch			SWK-21	SWK-21		U38	On-Off & Spot Eliminator
R2A	1M	½	27GV003H07	B-32	A47-1SK-S	Q11-119		Picture
B	Shaft			Not Req.	FB-3	Not Req.	Not Req.	
R3A	100K	½	27GV019H07					Brightness
B	1.5meg	½						Vert. Hold
C	500K	½						Vert. Lin.
R4A	90K	½	27GV019H06					Horiz. Hold
B	5meg	½						Height
C	600Ω	½						Quieting

* Use KR with CRL "red label" controls and KB with "blue label" controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING: OHMS	RATING: WATT	AIRLINE PART No.	NOTES
R5	100K 5%			
R6	15meg 5%			
R7	3900Ω			
R8	3900Ω			
R9	470Ω			
R10	47Ω			
R11	8200Ω			
R12	3900Ω			
R13	470Ω			
R14	47Ω			
R15	470Ω			
R16	150Ω			
R17	3900Ω 5%			
R18	470K			
R19	1meg			
R20	4700Ω			
R21	680Ω			
R22	2700Ω			
R23	2700Ω			
R24	2700Ω			
R25	150Ω			
R26	22K			
R27	10K			
R28	5600Ω	1		
R29	100Ω			
R30	220K			
R31	100K			
R32	470Ω			
R33	560K	1		
R34	12K			
R35	8200Ω	1		
R36	560Ω			
R37	82Ω			
R38	27K			
R39	47K			
R40	56K			
R41	6800Ω	2		

ITEM No.	RATING: OHMS	RATING: WATT	AIRLINE PART No.	NOTES
R42	470K			
R43	1.8meg			
R44	18K			
R45	47K			
R46	18K			
R47	82K			
R48	4.7meg			
R49	8200Ω 5%			
R50	150Ω			
R51	1meg			
R52	68K			
R53	8200Ω	1		
R54	3300Ω			
R55	560Ω			
R56	560Ω			
R57	680K			
R58	47K			
R59	39K	1		
R60	560K			
R61	82K			
R62	1500Ω			
R63	220K 5%			
R64	220K			
R65	330K	1		
R66	470K			
R67	150Ω			
R68	100Ω	1		
R69	15K			
R70	2200Ω			
R71	2.2Ω		25IV002A39	
R72	100K	1		
R73	180Ω	7	25IV020H52	
R74	560Ω	5	25IV020H53	
R75	7.5Ω		25V007H02	
R76	41Ω	20	25IV017H12	
R77	1meg			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	NOTES
L1 A	1st. Video IF	23SV003H01					
B	41.25MC Trap						
L2	2nd. Video IF	23SV004H01					
L3	47.25MC Trap	23SV008H01					
L4	3rd. Video IF	23SV004H01					
L5	4th. Video IF	23SV005H02					
L6	Series Peaking Coil	V-15796-1	19-3100	TV-181	6112	VP-3	100 Microhenries
L7	Shunt Peaking Coil	23SV019H12	19-3250	TV-185	6181	VP-6	330 Microhenries
L8	Series Peaking Coil	23SV010H02	19-3180	TV-184	6180	VP-5	170 Microhenries
L9	Shunt Peaking Coil	23SV010H09	19-3500	TV-203	6174	VP-8	500 Microhenries
L10	4.5MC Trap	V-15795-1					
L11	Sound IF	V-15795-2					
L12	Quadrature Coil	23SV007H03					
L13	RF Choke	23SV019H10	19-1006				14 Microhenries
L14	Fil. Choke	23SV005H02					1.1 Microhenries ①

① Not used in Model GTM-4202A.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES: PRI.	DC RES: SEC.	REPLACEMENT DATA: AIRLINE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No	NOTES
L15	100Ω		23SV005A01						

FILTER CHOKE

ITEM No	RATINGS: CURRENT (Measured)	RATINGS: DC RES.	RATINGS: INDUCTANCE @ CURRENT	REPLACEMENT DATA: AIRLINE PART No	Halldorson PART No	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No	Triad PART No
L16	260A	19Ω	.43 Hy. @ 1000 (~)	43SV032H04 ①						C-24X

① Alternate Part #43SV032H01.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No	Thordarson PART No.	Triad PART No
T1	Vert. Output	43SV053H01	21900 ①					25S70 ②	
T2	Yoke-Horiz. (21MH) (90°)-Vert. (38MH)	49SV003H01 ③	DF607 ④ ⑤	MDF-92 ⑤ ⑤	Y90F19/43 ⑤ ⑤	PMC2045 ⑤ ⑤	DY-16A ⑤ ⑤	Y-16 ⑤ ⑤	Y-41 & NW6 ⑥
	Alt. Yoke	49SV003H03							
	Rear Cover & Centering Device	78IV083H03							
	Alt. Rear Cover & Centering Device	V-18996-2							
	Yoke Clamp	76SV014H04							
T3	Horiz. Output	49IV004H09							

① Use 5 : 1 turns ratio.
② Drill new mounting hole(s).
③ Includes R55 and R56.
④ Connect same as original
⑤ Use original rear cover and centering device. Use original yoke damping network.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	2400Ω	3-4Ω	43SV031H01	Z1101 ①	A-3025 ①	AU-505 ①	A-3532 ①	26S56 ①	S-12X ①	① Use original channel frame.

SPEAKER

ITEM No.	TYPE: SIZE	TYPE: FIELD	TYPE: V. C. IMP.	REPLACEMENT DATA: AIRLINE PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	57SV039H01	4A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	AIRLINE PART No	REPLACEMENT DATA
K1	Vert. Integrator		21SV003H01	Centralab PC-104 Sprague V-3
K2	Horiz. AFC Circuit	82mmf, 82mmf, 390mmf, 680mmf, 8200Ω, 12K, 680K, 1meg	21SV002H03	
K3	Chassis Isolation	1000mmf @ 1400V, 330K	21SV004H03	

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: AIRLINE PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.310A	29SV006H02 ①	HF504 ①	1N1008 ②	8D-94 ①	M500 ①	① Silicon Type. ② Germanium Type

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: AIRLINE PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M2	K8 *	V-10H16-3	1N84	1N295	Video Detector (Pigtail) * Some versions may use 1N84G or 1N295 in this application.

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Tuner	47OV054H01	VHF, with UHF Provisions, Model GTM-4302A
	Tuner	47OV053H01	VHF, Model GTM-4202A
M4	Tuner	47ZV034H01	UHF
	Printed Board	35OV044H01	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

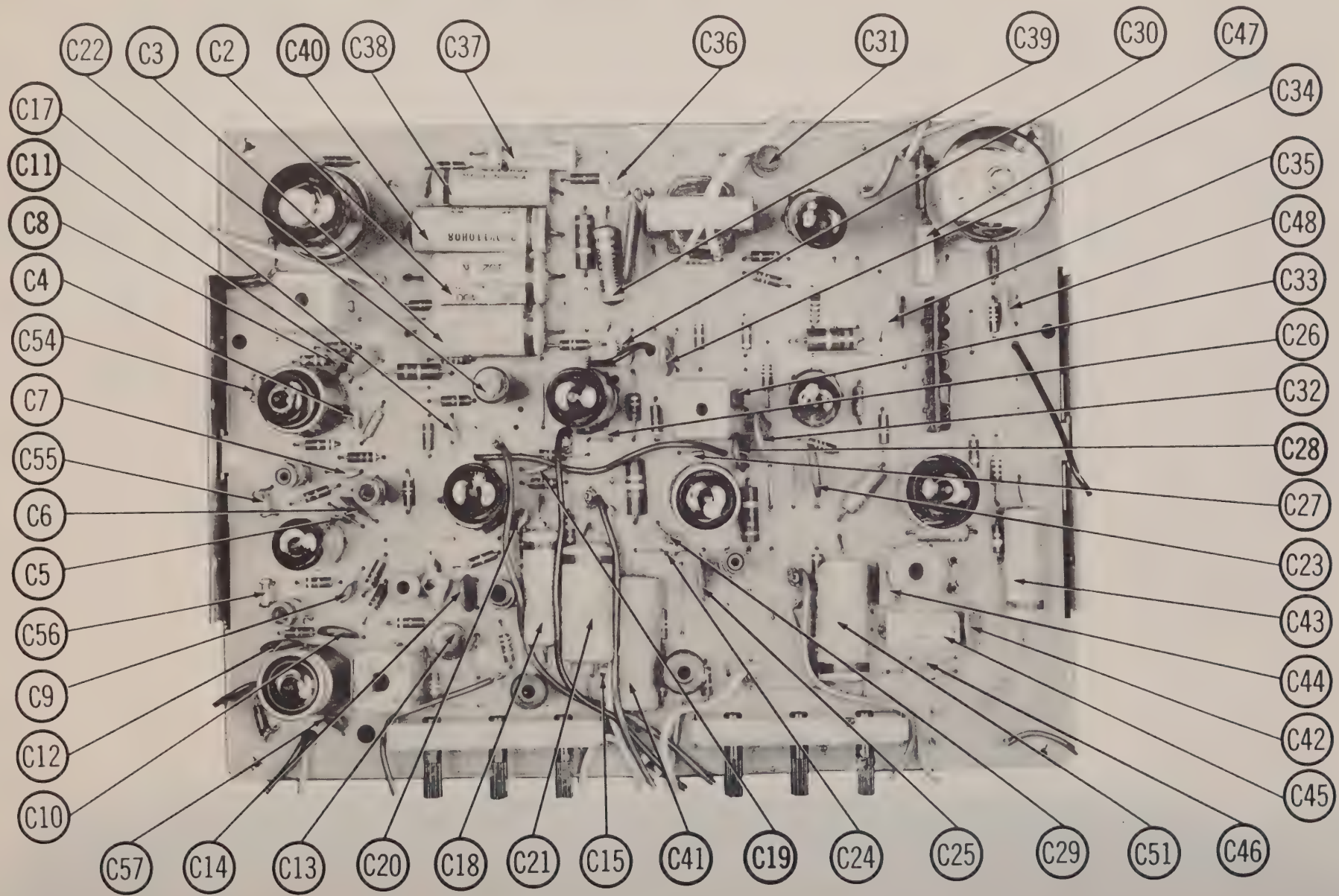
NAME	PART NO.	DESCRIPTION
Safety Glass	63SV004H02	
Mask	61OV028H02	
Knob	55OV032H13	VHF Channel Selector
Knob	55OV031H07	VHF Fine Tuning
Knob	55OV050H01	UHF Tuning
Knob	55OV054H06	Contrast
Knob	55OV054H05	On-Off-Volume
Handle Assembly	78TV112H01	

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8486 (Round) - 8 Conductor

AIRLINE MODELS GTM-4202A, GTM-4302A

FOLDER 1



CAPACITOR IDENTIFICATION

ALIGNMENT INSTRUCTIONS (cont)

ALTERNATE SOUND IF ALIGNMENT USING SIGNAL GENERATOR

Connect a high impedance AC voltmeter or scope across the Volume control to serve as an indicator.
Set Quieting control (R4C) to the center of its range.
Apply a 4.5MC FM signal (15KC Swp) to point Ⓑ . Connect low side to chassis.
Using a strong signal, adjust A8 for maximum deflection.
Reduce the signal strength to the lowest point that will provide an indication. Adjust A9 for maximum deflection.
Replace the FM signal with a 4.5MC AM signal (30% Mod.) and adjust the generator for a strong output.
Adjust the Quieting control for MINIMUM response or output.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 6.

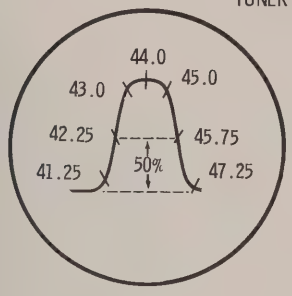


FIG. 1

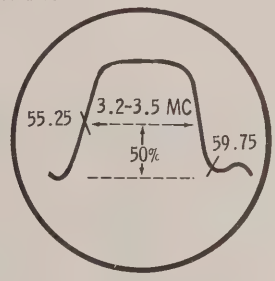


FIG. 2

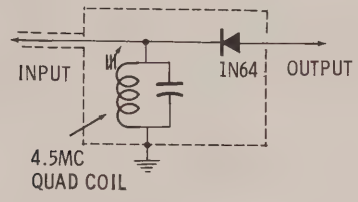
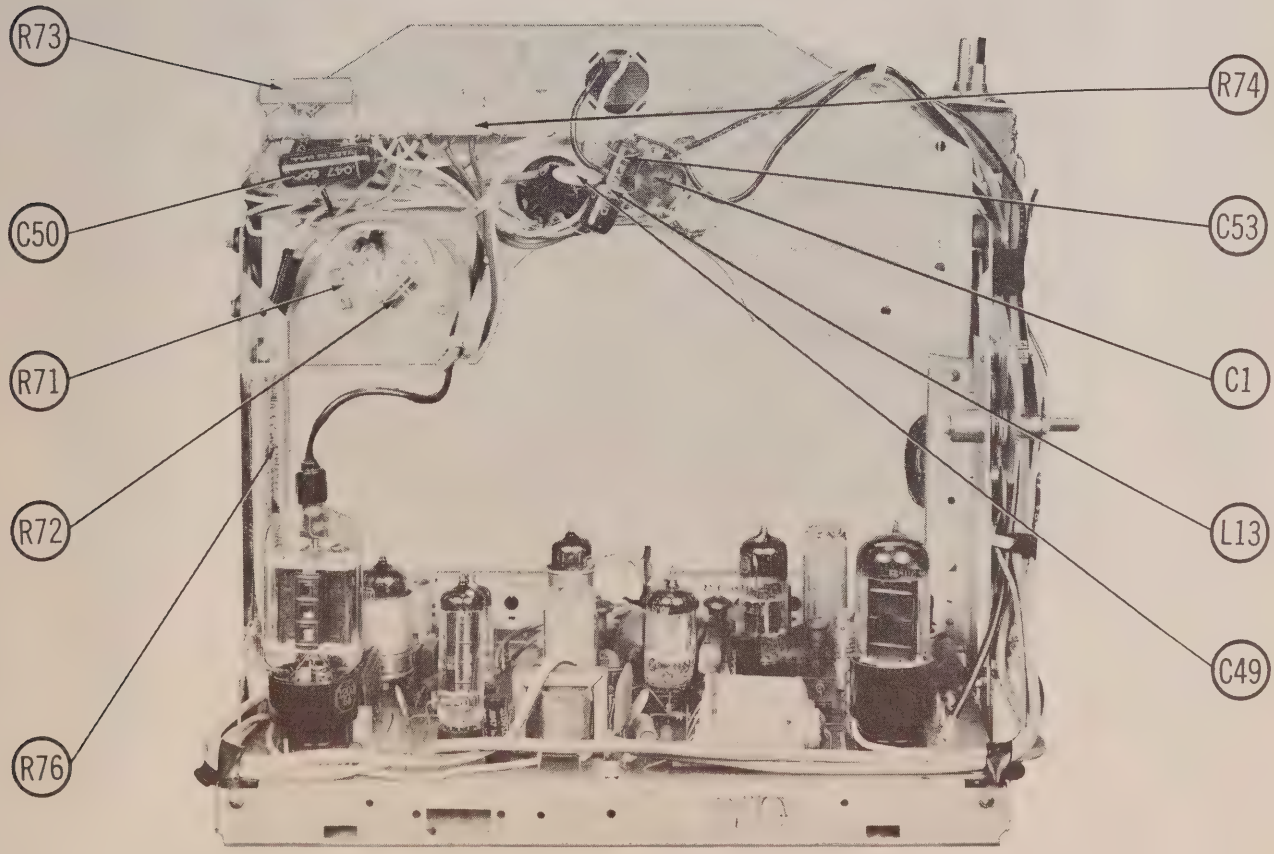
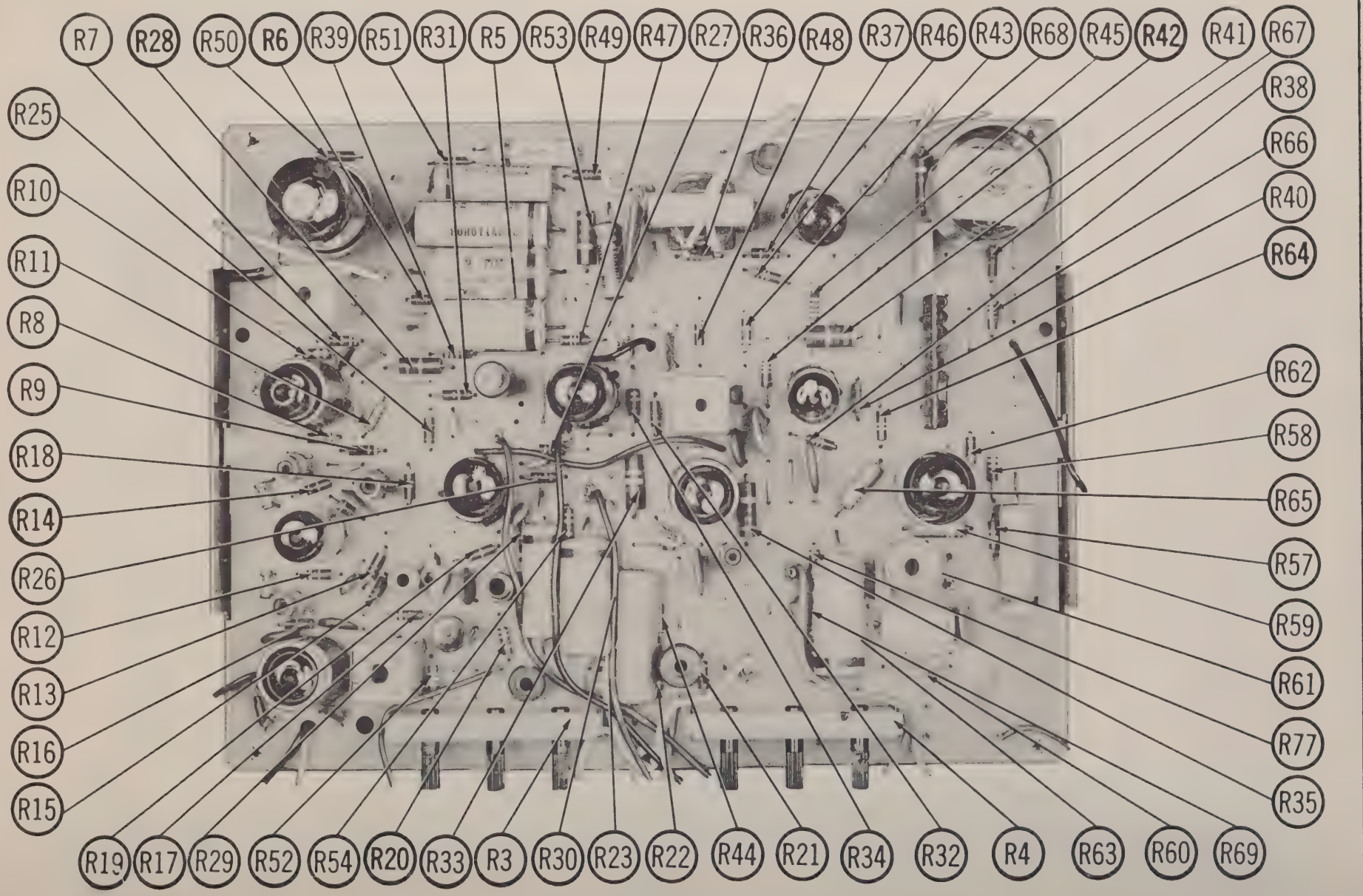


FIG. 3



CHASSIS FRONT VIEW



RESISTOR IDENTIFICATION

TUNER PARTS LIST AND DESCRIPTIONS

470V053H01

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120		13L8Z121K		DTZ-120				5%
C202	30		13M320U300NH-Z3						
C203	15		13L8GP150K	NPO-DI 15	DTZ-15	C10Q15C		5TCC-Q15	10%
C204	15		18L8GP150J						5%
C205	1000		13L8X102Z	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C206	2-10		31B-902-09						
C207	800		13M320EA801Z-Z3						
C208	2-6		31B-902-01						
C209	47		13M130U470J-01						
C210	800		13M320EA801Z-Z3						
C211	800		13M320EA801Z-Z3						
C212	51		13L10T510K						N470
C213	2-6		31B-902-01						
C214	1000		31JA-024	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C215	1		13D111-35						10%
C216	10		13L8T100D						N470
C217	10		13L8Q100F						N1400
C218	1.8								①
C219	1000		13L8X102Z	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C220	60		13M320Q600J-Z3						
C221	800		13M320EA801Z-Z3						
C222	1000		13L8X102Z	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C223	800		13M320EA801Z-Z3						
C224	680			BPD-00068	DD-681	BYA10T68	UC-5368	5GA-T68	②

NOTE: Part numbers listed above are "Standard Coil" part numbers.
① Not used in some versions.
② Not used in Tuner #470V053H01.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R201	4700Ω			
R202	470Ω			Note 1
R203	2700Ω	1		
R204	3300Ω			
R205	10K			

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R206	220K			
R207	10K			
R208	1000Ω			
R209	10K			
R210	5600Ω			

Note 1. Tuner #470V053H01 uses 1000Ω in this application.

COILS (RF-IF)

ITEM No.	USE	PART No.	NOTES
L201	Ant. Trans.	31T-3066	
L202	IF Trap Coil	34A-763	
L203	IF Trap Coil	34A-762	

ITEM No.	USE	PART No.	NOTES
L204	Mixer Plate	31UA-580	
L205	RF Choke	25A-211-01	

Note: Part numbers listed above are "Standard Coil" part numbers.

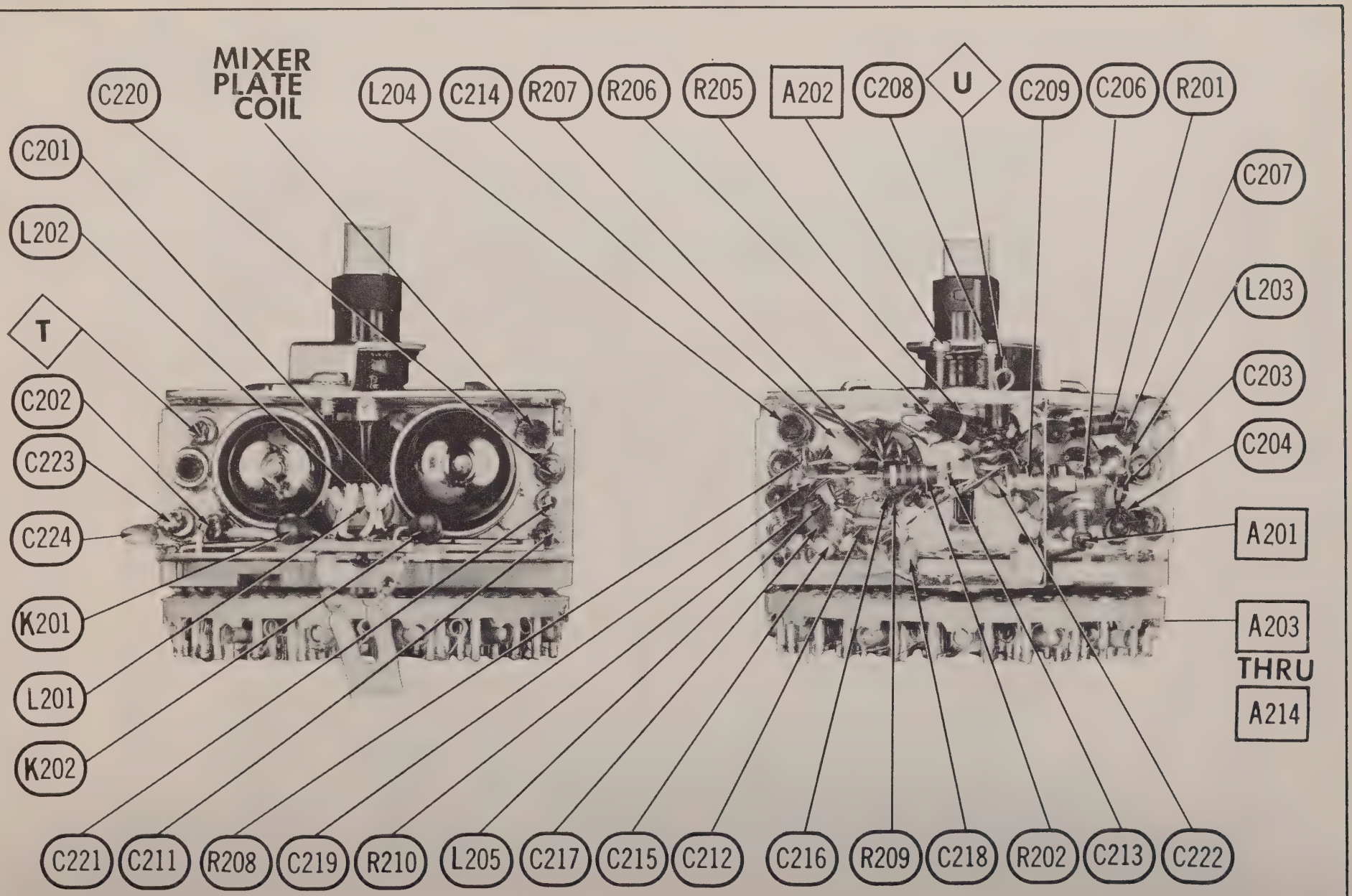
COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA	
K201	Antenna Isolation	330mmf, 220K		Centralab	RC-431
K202	Antenna Isolation	330mmf, 220K		Centralab	RC-431

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
V201	UHF Rear Cover	31J-010-051	

NOTE: Part number listed above is "Standard Coil" part number.



TUNER 470V053H01

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	475K	47Ω	7Ω	6.5Ω	†650Ω	†650Ω	0Ω		
V2	3BZ6	480K	47Ω	6.5Ω	6Ω	†650Ω	†650Ω	0Ω		
V3	3DK6	.1Ω	150Ω	6Ω	5Ω	†650Ω	†650Ω	0Ω		
V4	6BH8	100Ω	10K	†5700Ω	10.5Ω	9.5Ω	150Ω	1meg	†180Ω	†3800Ω
V5	3BN6	•450Ω	.4Ω	11.5Ω	10.5Ω	†8300Ω	7.7Ω	†560K		
V6	12C5/ 12CU5	82Ω	0Ω	12Ω	14Ω	0Ω	†1100Ω	†850Ω		
V7	3CS6	27K	0Ω	11.5Ω	12Ω	†35K	†6900Ω	2meg		
V8	6CN7	0Ω	1.6meg	680K	0Ω	0Ω	0Ω	•1.1meg	•‡6meg	1Ω
V9	12EN6GT	NC	9.5Ω	†130Ω	†180Ω	•1.2meg	NC	7Ω	0Ω	
V10	7AU7	†180K	•240K	1500Ω	19Ω	19Ω	†39K	2.3meg	1500Ω	18Ω
V11	12DQ6	NC	14Ω	NC	†100Ω	470K	NC	18Ω	.6Ω	TOP CAP ‡12Ω
V12	12D4GT	NC	TP	¶300K	NC	†19Ω	NC	19Ω	21Ω	
V13	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡712Ω
V14	17CFP4	1Ω	100K	Pin 6 †200Ω	Pin 10 ‡1meg	Pin 11 •240K	Pin 12 2.5Ω			
V201	2BN4	0Ω	500K	5Ω	4.5Ω	†1100Ω	0Ω	100K		
V202	5CG8	10K	†5700Ω	0Ω	3Ω	4.5Ω	†1100Ω	†10K	0Ω	230K
V203	2AF4A	*†3200Ω	*5600Ω	2.5Ω	3Ω	.1Ω	*5600Ω	*†3200Ω		
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

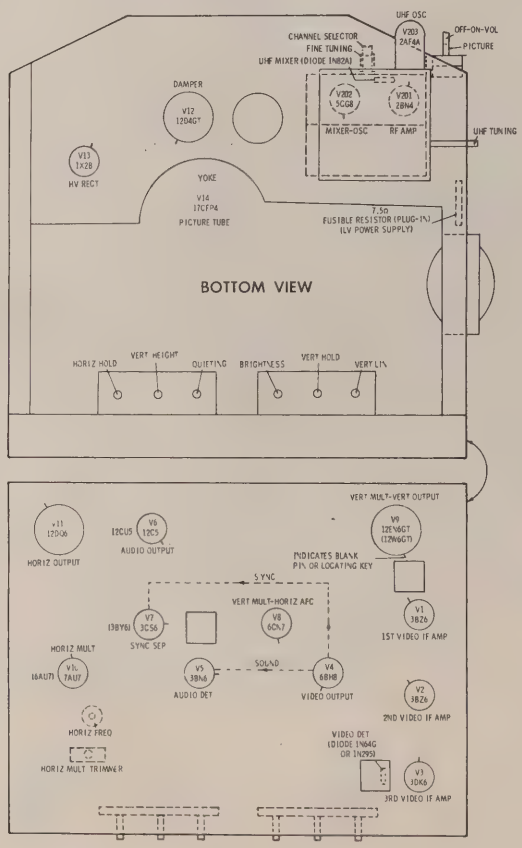
† MEASURED FROM 140V SOURCE.

‡ MEASURED FROM PIN 3 OF V11.

* MEASURED IN "UHF" POSITION.

NC NO CONNECTION

TP TIE POINT



TUBE PLACEMENT CHART

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MOTOROLA MODELS Y21P1B, BR, GY, 21P1B, BR, GY (Ch. PTS-546, Y)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MOTOROLA MODELS Y21P1B,
BR, GY, 21P1B, BR, GY (Ch. PTS-546, Y)

MODEL Y21P1B (CH. PTS-546Y)

MOTOROLA MODELS Y21P1B,
BR, GY, 21P1B, BR, GY (Ch. PTS-546, Y)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 top knobs.
2. Remove 8 metal screws holding rear cover. Remove rear cover.
3. Remove 1 metal screw holding grounding rod top rear center.
4. Remove 4 wedge clips, top inside, holding control panel hood.
5. Partially remove control panel hood and remove speaker leads. Remove 1 metal screw holding control panel bracket to cabinet.
6. Remove 2 bottom chassis bolts.
7. Remove 2 phillips screws (1 each side, front) holding front and chassis to cabinet.
8. Remove chassis from the front.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

MODEL Y21P1B (CH. PTS-546Y)

MOTOROLA MODELS Y21P1B, BR, GY, 21P1B, BR, GY (Ch. PTS-546, Y)

TRADE NAME	Motorola	MODELS	CHASSIS
		21P1B, 21P1BR, 21P1GY	PTS-546
		Y21P1B, Y21P1BR, Y21P1GY	PTS-546Y
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois		
TYPE SET	Television Receiver		
TUBES	Eighteen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 170 Watts, 1.66 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the Channel Selector and Fine Tuning knobs. Set the Fine Tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 12 o'clock, proceed in a counterclockwise direction adjusting for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws holding metal retainer at the top. Lift safety glass up and out from bottom retainer.

FOCUS

The focus may be varied in steps by the position of a plug in the Focus Adjustment board.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Multivibrator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

FUSE

One fuse is used for low voltage supply protection. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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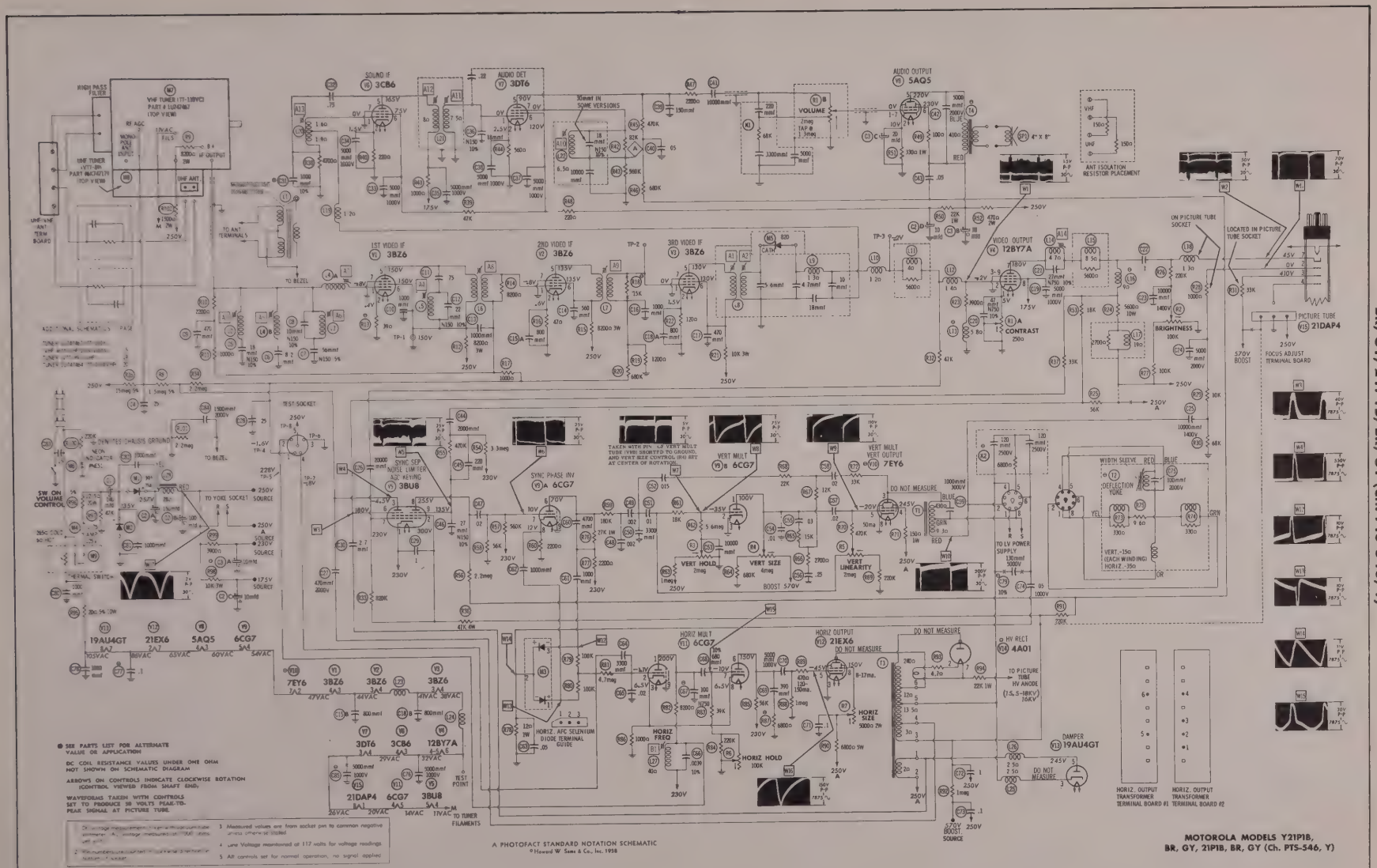
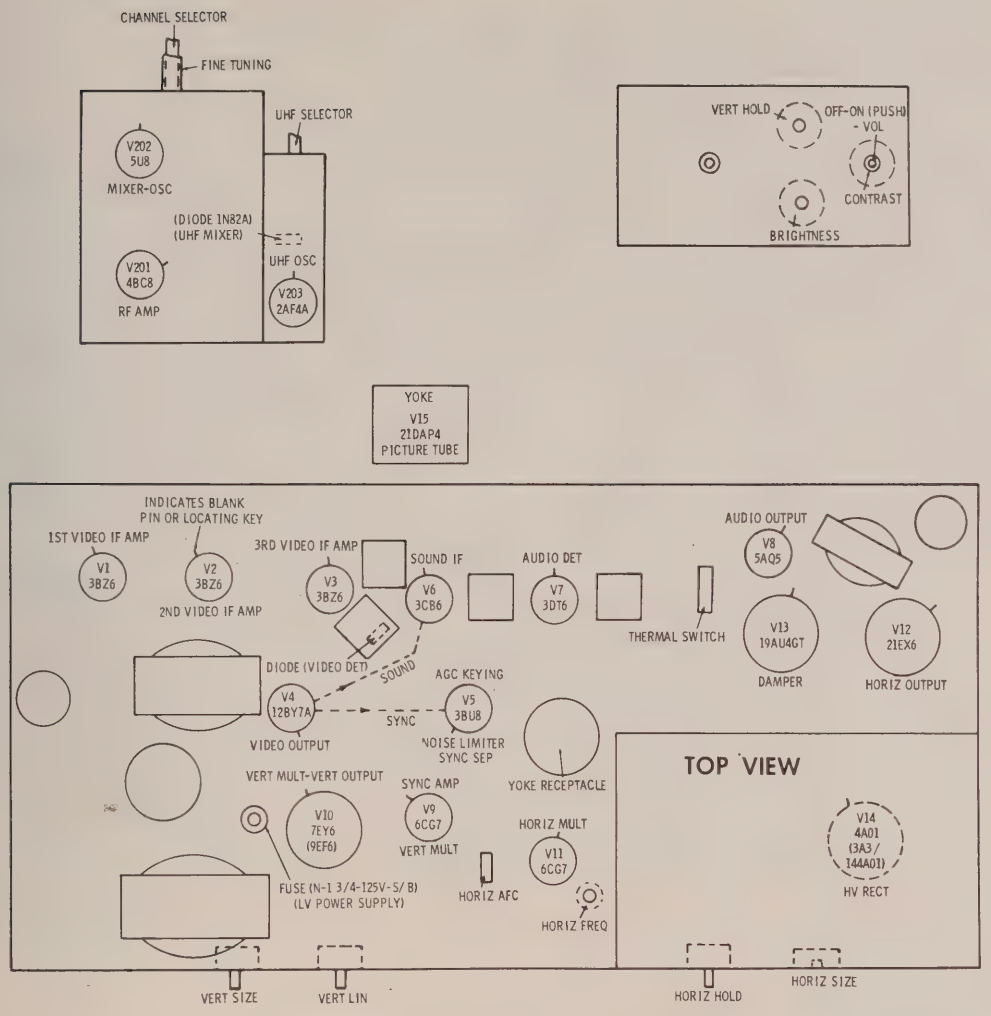

HIGH PASS FILTER
VHF TUNER (T7-13BVC) PART # 3J24D2B2 (TOP VIEW)
UHF TUNER (VT7-BR) PART # 3A24D1B1 (TOP VIEW)
UHF-VHF ANT. TERM BOARD
TO ANT. TERMINALS
TO BEZEL
SOUND IF V6 3CB6
AUDIO DET V7 3DT6
35mmH IN SOME VERSIONS
VOLUME
AUDIO OUTPUT V5 5AQ5
4" X 8"
ANT ISOLATION RESISTOR PLACEMENT
1ST VIDEO IF V1 3BZ6
2ND VIDEO IF V2 3BZ6
3RD VIDEO IF V3 3BZ6
VIDEO OUTPUT V4 12B7A
ON PICTURE TUBE SOCKET
LOCATED IN PICTURE TUBE SOCKET
CONTRAST
BRIGHTNESS
PICTURE TUBE V15 21DAP4
570V BOOST
FOCUS ADJUST TERMINAL BOARD
TEST SOCKET
SW ON VOLUME CONTROL
TO YOKE SOCKET SOURCE
SYNC SEP NOISE LIMITER AGC KEYING V5 3BU8
SYNC PHASE INV V9 A 6CG7
TAKEN WITH PIN #2 VERT MULT TUBE (V9B) SHORTED TO GROUND, AND VERT SIZE CONTROL (R64) SET AT CENTER OF ROTATION
VERT MULT V8 B 6CG7
VERT MULT VERT OUTPUT V10 7EY6
DO NOT MEASURE
VERT HOLD
VERT SIZE
VERT LINEARITY
BOOST 570V
WIDTH SLEEVE
DEFLECTION YOKE
VERT.-15Ω (EACH WINDING)
HORIZ.-35Ω
TO LV POWER SUPPLY
HORIZ MULT V11 6CG7
HORIZ OUTPUT V12 21EX6
HORIZ. AFC SELENIUM DIODE TERMINAL GUIDE
HORIZ FREQ
HORIZ SIZE
HORIZ HOLD
G HV RECT V14 4A01
TO PICTURE TUBE HV ANODE (15.5-18KV) 16KV
DAMPER V13 19AU4GT
HORIZ. OUTPUT TRANSFORMER TERMINAL BOARD #1
HORIZ. OUTPUT TRANSFORMER TERMINAL BOARD #2
19AU4GT V13 105VAC
21EX6 V12 65VAC
5AQ5 V5 60VAC
6CG7 V9 54VAC
7EY6 V10 47VAC
3BZ6 V1 44VAC
3BZ6 V2 44VAC
3BZ6 V3 44VAC
3DT6 V7 29VAC
3CB6 V6 29VAC
12B7A V4 29VAC
21DAP4 V15 26VAC
6CG7 V9 20VAC
3BU8 V5 14VAC
TO TUNER FILAMENTS
TEST POINT
SER PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END).
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
3 Measured values are from socket pin to common negative unless otherwise specified
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1958
MOTOROLA MODELS Y21P1B, BR, GY, 21P1B, BR, GY (Ch. PTS-546, Y)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

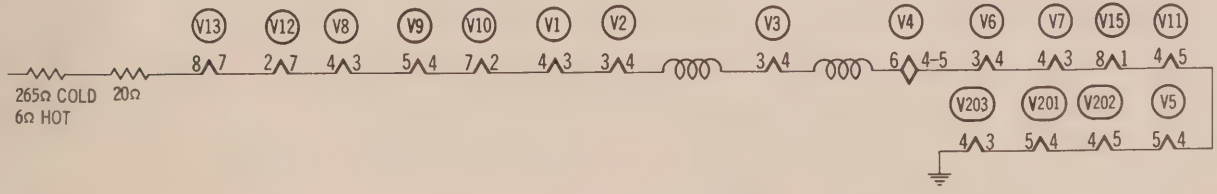
POWER SUPPLY FAILURE
No raster, no sound Fuse (M4), Rectifier (M1, M2)

SWEEP FAILURE
No raster, has sound Rectifier (M3), V11, V12, V13, V14, V15
No vertical deflection V9, V10
Poor vert. linearity or foldover V9, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, M1, M2
Vert. off freq. V9, V10
Horiz. off freq. V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (M5)
No pic, no sound, has snow V201, V202, V1 (V203 UHF only)
No pic, has sound, has raster V4, V15
Has pic, no sound V6, V7, V8
Overloaded picture V5

SYNC FAILURE
No vert. sync V5, V9
No horiz. sync V5, V9, M3
No vert. or horiz. sync V5, V9

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: General Cement #8282, 8606, 8606L or 9295
Walsco #2543, 2544 or 2545

VIDEO IF ALIGNMENT

Remove deflection yoke plug to eliminate RF interference from the horizontal sweep circuit. Connect a 1500Ω 50 watt resistor from TP-8 to TP-6. (CAUTION : TP-8 has B+ voltage on it.)
Disable the tuner oscillator by shorting the Mixer Grid (V202) to chassis.
Set the Contrast control fully counterclockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Maintain between 2 and 5 volts peak to peak on the scope, except where otherwise noted in the procedure.
Connect the negative lead of a 6 volt bias supply to TP-4. Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to TP-2. Low side to chassis.	44.0MC (10MC Swp)	42.5MC 45.75MC	13	Vert. Amp. thru 47K to TP-3. Low side to chassis.	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Peak with maximum core separation.
2.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	"	47.25MC	"	"	A3, A4	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil away from chassis.
3.	"	"	"	41.25MC	"	"	A5	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil nearest chassis.
4.	"	"	"	39.75MC	"	"	A6	Adjust to place marker in trap notch as in Fig. 2. Tune slug at end of coil away from chassis.
5.	"	"	"	39.75MC 41.25MC 44.0MC 45.75MC 47.25MC	"	Vert. Amp. to TP-1. Low side to chassis.	Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. The Mixer Plate Coil affects the center peak and A7 affect the two outside peaks. Tune slug at end of coils away from chassis. If a suckout (trap effect) occurs, detune A8.
6.	"	"	"	42.25MC 45.75MC	"	Vert. Amp. to TP-3. Low side to chassis.	A8, A9	Adjust A8 to place 42.25MC marker at 50% as in Fig. 4. Adjust A9 to place 45.75MC marker at 50% on other side. Tune slugs to end of coil nearest chassis. If necessary, retouch Mixer Plate Coil to correct tilt. Retouch A8 and A9 for correct response.

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust all controls for normal picture and sound.
Connect the DC probe of VTVM to point (A). Common to chassis. Adjust A10 for maximum deflection choosing the one of two peaks that produce the highest voltage. While listening to the sound, retouch A10 for maximum sound with MINIMUM distortion.
Change to a very weak signal (this may be done by loosely coupling the antenna lead in to the receiver terminals) that produces a hiss in the sound. The slug (A11) is a preset slug which should be set near the top of the coil form and left there. Adjust A12 for maximum sound and MINIMUM distortion. Adjust A13 for maximum undistorted sound. If the sound is not clear at this point, repeat the above procedure as necessary.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and turn the Contrast control fully clockwise.
Adjust the Fine Tuning until a strong 4.5MC beat pattern is visible.
Adjust A14 to find the two points at which the beat pattern is just noticeable on the screen. Tune the slug to the center of these two points. (Use the MINIMUM amount of inductance that will result in no apparent beat pattern.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGES 6 & 19

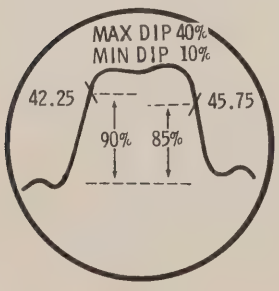


FIG. 1

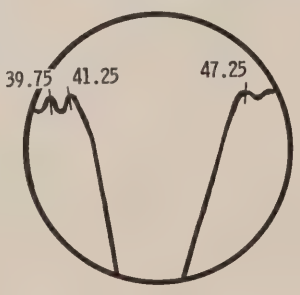


FIG. 2

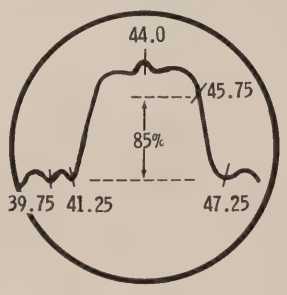


FIG. 3

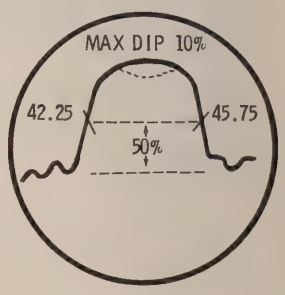
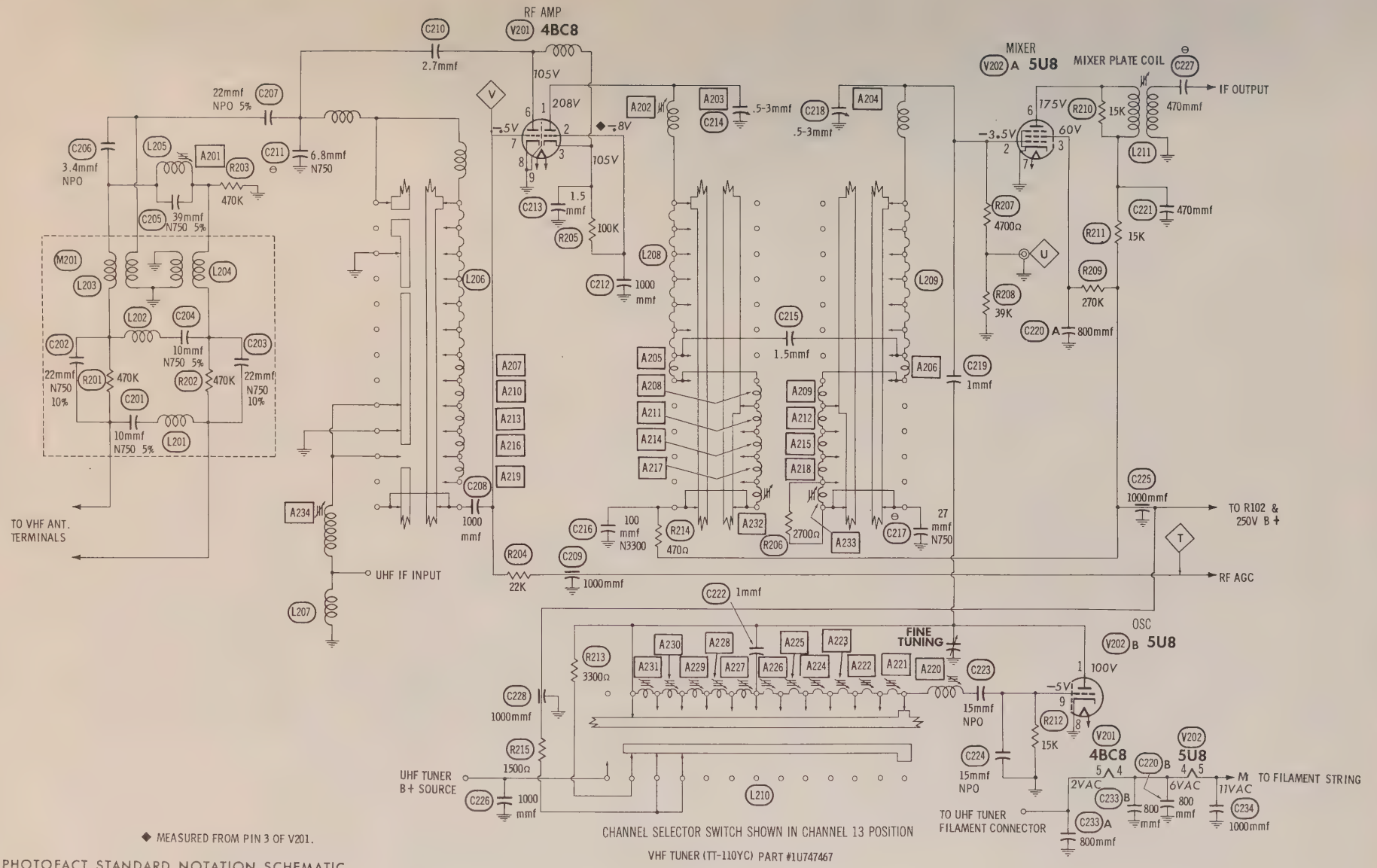


FIG. 4



◆ MEASURED FROM PIN 3 OF V201.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER WITH UHF PROVISIONS 1U747467 (TT-110Y)

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lad should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested alignment tools: A201, A207, A232, A233, A234 ..... General Cement #8282, 8606, 8606L, 9295
Walsco #2543, 2544, 2545
A202 ..... General Cement #9050L, 9150
Walsco #2521, 2527
Remove yoke plug to prevent interference radiation. Connect an 1800Ω 50watt resistor from B+ to chassis.

VHF RF AND MIXER ALIGNMENT

Connect a clip lead from point Ⓣ to chassis.
Remove the tuner shield.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	94MC	94MC	6	Vert. Amp. thru 47K to point Ⓤ. Low side to chassis.	A201	Adjust for MINIMUM response at 94MC marker .
2.	"	"	213MC	211.25MC 215.75MC	13	"	A202	Preset A203 and A204 to mid-range. Adjust A202 for maximum gain and symmetry similar to Fig. 201.
3.	"	"	183MC	181.25MC 185.75MC	7	"	A203, A204	Adjust for maximum gain and symmetry of response similar to Fig. 201 with marker as shown.
4.	"	"	85MC	83.25MC 87.75MC	6	"	A205, A206, A207	Adjust in numerical order for response similar to Fig. 202. First two adjustments are for proper placing of markers. Third adjustment is for maximum gain and symmetry.
5.	"	"	"	"	"	"	A201	Readjust SLIGHTLY above point where it begins to effect response curve at sound marker.
6.	"	"	79MC	77.25MC 81.75MC	5	"	A208, A209, A210	Adjust in numerical order for response similar to Fig. 202. First two adjustments are for proper placing of markers. Third adjustment is for maximum gain and symmetry.
7.	"	"	69MC	67.25MC 71.75MC	4	"	A211, A212, A213	"
8.	"	"	63MC	61.25MC 65.75MC	3	"	A214, A215, A216	"
9.	"	"	57MC	55.25MC 59.75MC	2	"	A217, A218, A219	"
10.	"	"	44MC	42.5MC 44.5MC	"	"	L201, L202	Adjust L201 for MINIMUM response at 42.5MC marker and L202 for MINIMUM at 44.5MC. Retouch either or both for flat response with MINIMUM amplitude at markers. (CAUTION! Cover of filter must be in place when observing response on scope.)

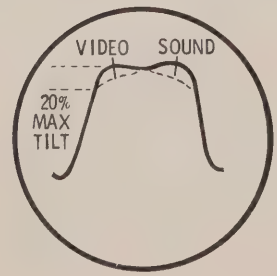


FIG. 201

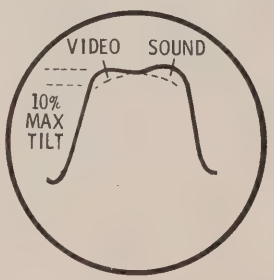


FIG. 202

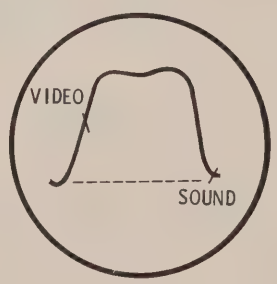


FIG. 203

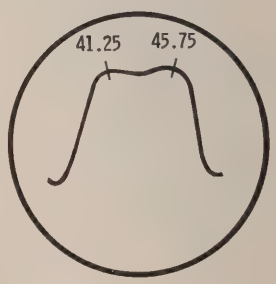
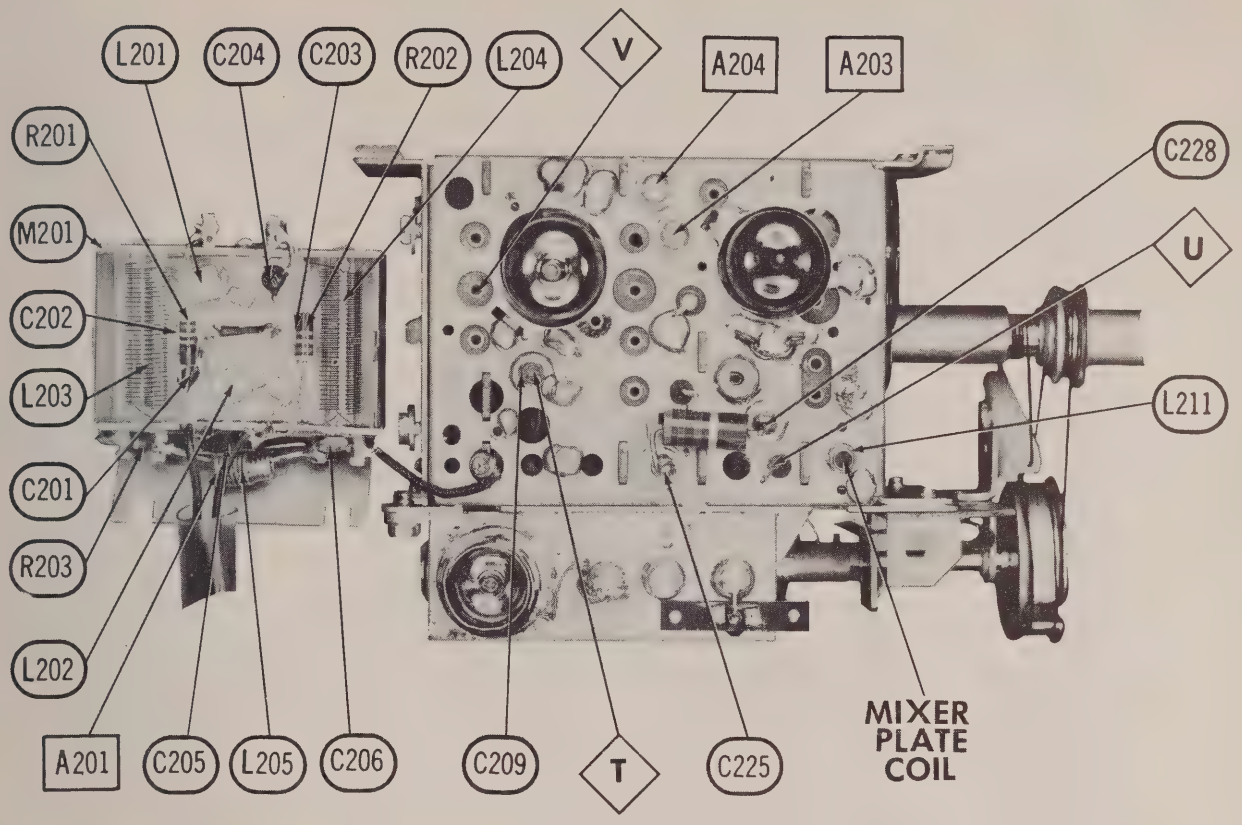
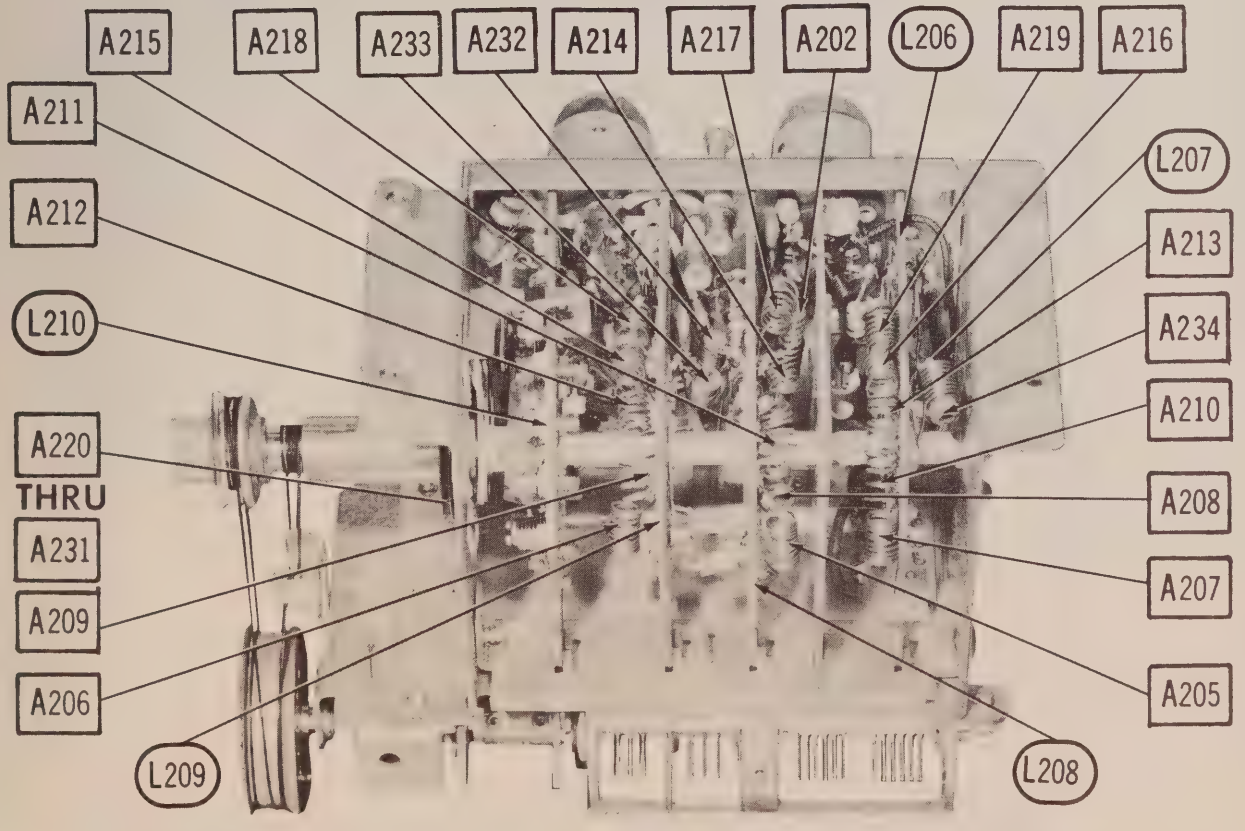


FIG. 204

CONTINUED PAGE 19



TUNER 1U747467 (TT-110Y) TOP VIEW



TUNER 1U747467 (TT-110Y) INDUCTOR & ALIGNMENT IDENT

TUNER 10747467 PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	4BC8	
V202	Mixer-Osc.	5U8	

ITEM No.	USE	TYPE	NOTES
V203	UHF Osc.	2AF4A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	10		21R124553						N750 5%
C202	22		21R125944	N750-DI 22	DTN-22	C10Q22U		5TCU-Q22	N750 10%
C203	22		21R125944	N750-DI 22	DTN-22	C10Q22U		5TCU-Q22	N750 10%
C204	10		21R124553						N750 5%
C205	39		21R122051						N750 5%
C206	3.4		21R124489						NPO
C207	22		21R124554						NPO 5%
C208	1000		21R115386	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C209	1000		21K739920	EF-001	MFT-1000			503C-D1	
C210	2.7		21R115950						
C211	6.8		21R124609		TCN-6R8	CTA6V68U			N750 ①
C212	1000		21R115386	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C213	1.5		21R115959	NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15	
C214	.5-3		21K735985		829-3		CT565A		
C215	1.5		21R115959	NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15	
C216	100		21R120577						N330
C217	27		21R122050						N750 ②
C218	.5-3		21K735985		829-3		CT565A		
C219	1.0		21R124552	NPO-SI 1.0	TCZ-1				
C220A	800		21K747024	BPD-0008	DD-801	L10T8	UC-538	5GA-T8	
B	800			BPD-0008	DD-801	L10T8	UC-538	5GA-T8	
C221	470		21R114554	BPD-00047	DD-471	L10T47	UC-5347	5GA-T47	
C222	1.0		21R114071	NPO-SI 1.0	TCZ-1				
C223	15		21R125066	NPO-DI 15	DTZ-15	C10Q15C	UC-5415	5GA-Q15	NPO
C224	15		21R128077	NPO-DI 15	DTZ-15	C10Q15C	UC-5415	5GA-Q15	NPO
C225	1000		21K739920	EF-001	MFT-1000			503C-D1	
C226	1000		21R115386	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C227	470		21R114554	BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	③
C228	1000		21K739920	EF-001	MFT-1000			503C-D1	
C229	1.5			NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCU-T15	
C230	1000			EF-001	MFT-1000			503C-D1	
C231	1000			EF-001	MFT-1000			503C-D1	
C232	1000			EF-001	MFT-1000			503C-D1	
C233A	800		21K747024	BPD-0008	DD-801	L10T8	UC-538	5GA-T47	
B	800			BPD-0008	DD-801	L10T8	UC-538	5GA-T47	
C234	1000		21R115386	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	

① Tuner TT-110 uses 8.2mmf in this application (Part #21R125856).
② Tuner TT-110 uses 22mmf in this application (Part #21R124554).
③ Some versions may use 1000mmf in this application (Part #21R115386).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R201	470K		6K121279	
R202	470K		6K121279	
R203	470K		6K119406	
R204	22K		6K119405	
R205	100K		6K122313	
R206	2700Ω		6K119926	
R207	4700Ω		6K121847	
R208	39K		6K125535	
R209	270K		6R6414	

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R210	15K		6K119934	
R211	15K		6K119934	
R212	15K		6K119934	
R213	3300Ω		6K121725	
R214	470Ω		6K127633	
R215	1500Ω		6K127513	
R216	27K			
R217	1200Ω			

COILS (RF-IF)

ITEM No.	USE	MOTOROLA PART No.	NOTES
L201	RF Choke	†24K745828	
L202	RF Choke	†24K745828	
L203	VHF Ant. Trans	†24K744200	
L204	VHF Ant. Trans	†24K744200	
L205	Trap Coil	24A746143	
L206	VHF Ant. Coils	1V744170	Channel 2-13, Includes wafer assy. C207, C208 & C211
L207	RF Choke	24A744761	

ITEM No.	USE	MOTOROLA PART No.	NOTES
L208	VHF RF Coils	1V743452	Channel 2-13, Includes wafer assy. C213 & C216
L209	VHF Mixer Grid Coils	1V739792	Channel 2-13, Includes wafer assy. C219 & R206
L210	VHF Osc. Coils	1V744848	Channel 2-13, Includes wafer assy. C219, C224, R213 & R215
L211	Mixer Plate	24B747599	

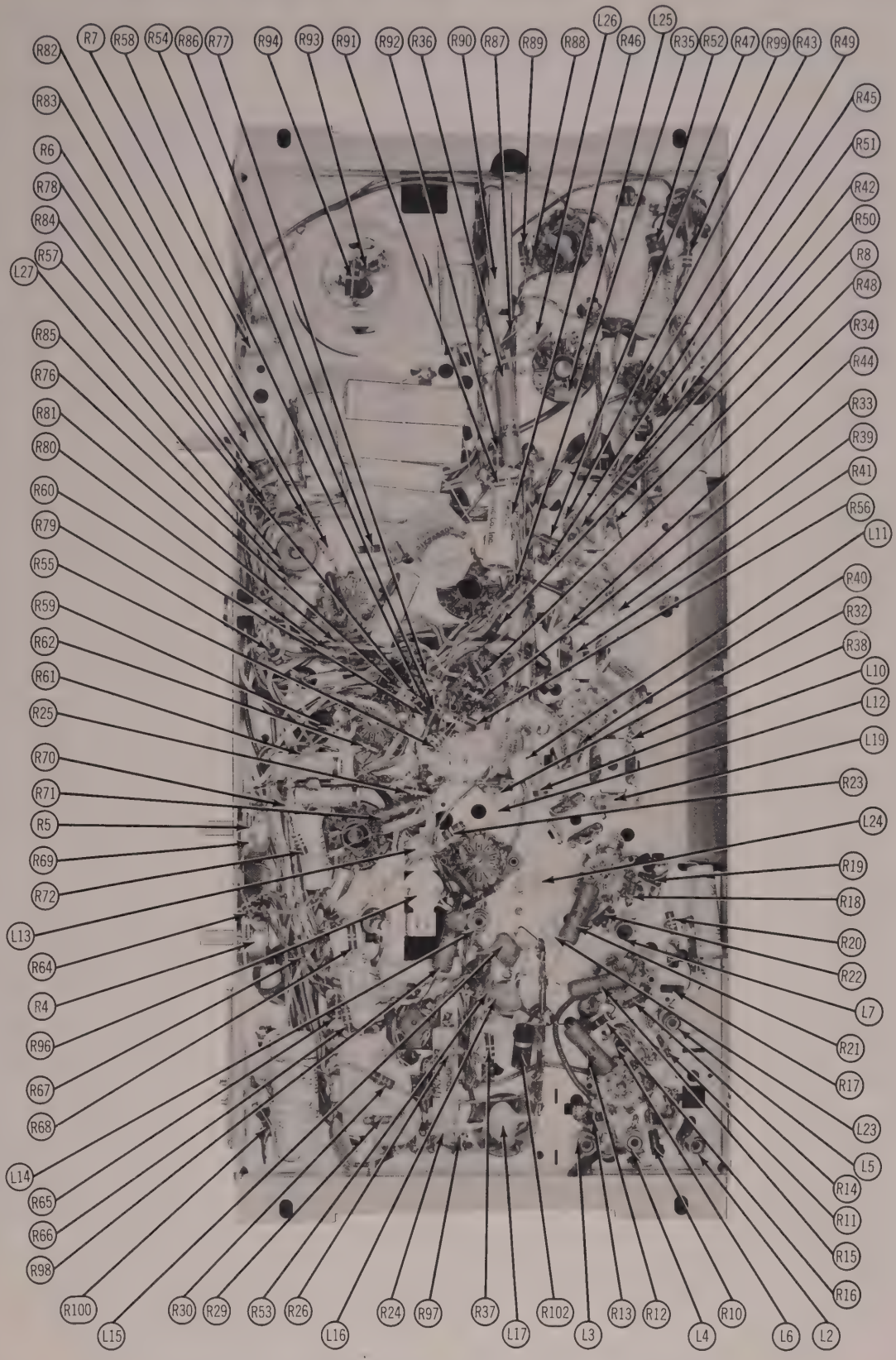
† Part of M201 Part #1V746676.

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M201	Antenna Input Assy.	1V746676	Includes C201, C202, C203, C204, L201, L202, L203, L204, R201 & R202

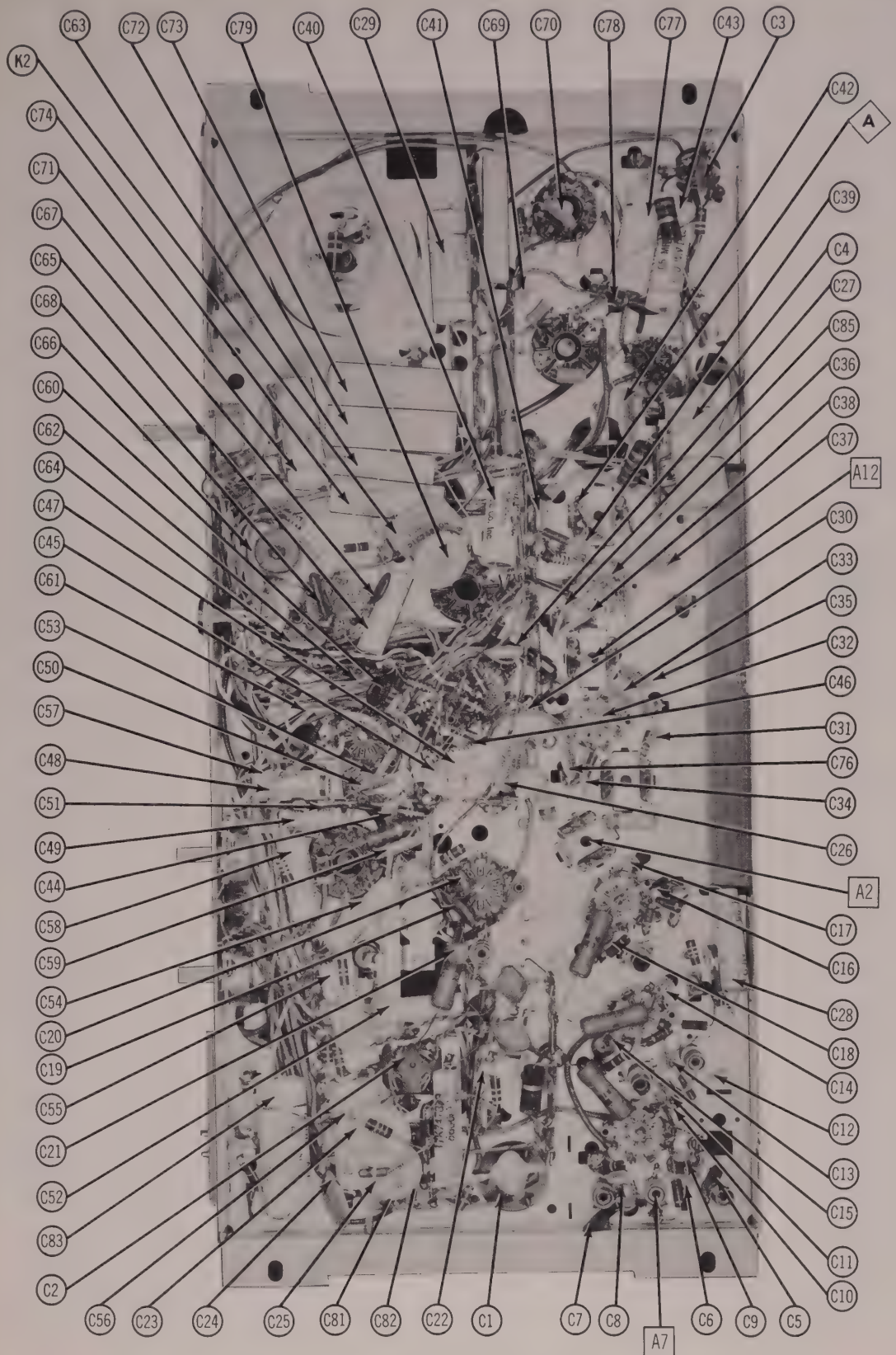
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MOTOROLA PART No.	CBS PART No.	SYLVANIA PART No.	
M202	M48C		1N82A	1N82A	UHF Mixer (Clip-in)

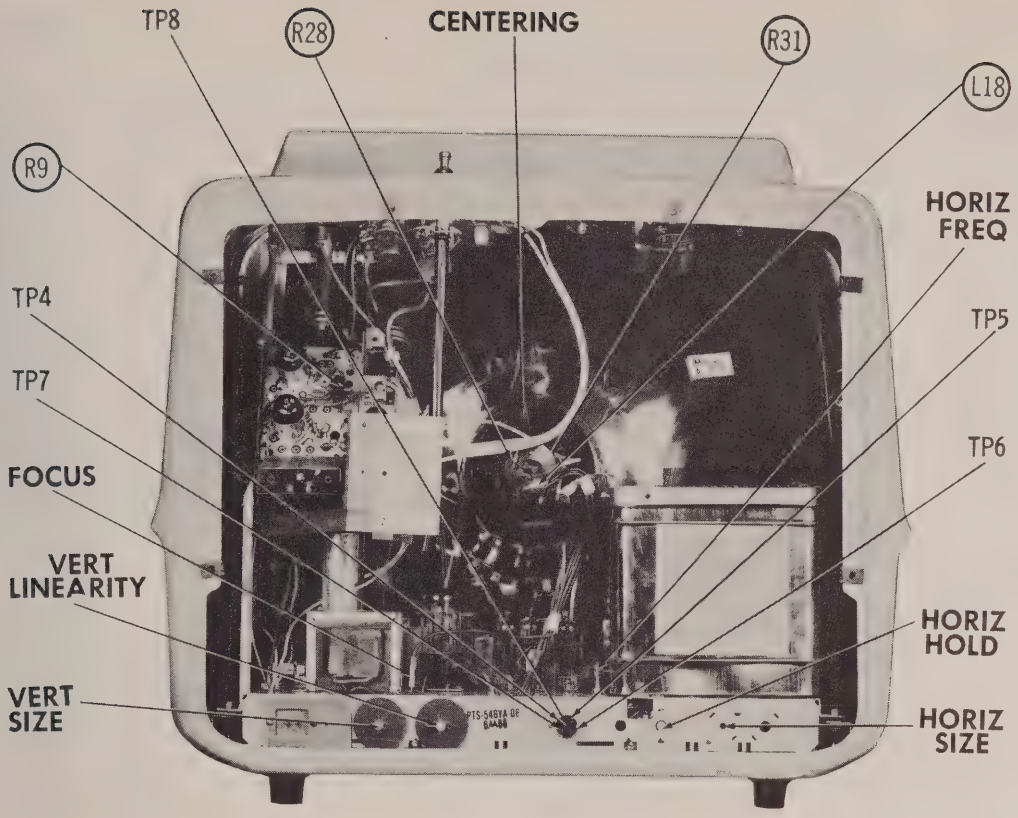


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

MOTOROLA MODELS V21P1B, BR, GY, 21P1B, BR, GY (Ch. P1S-546, Y)



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TP1	150V	1ST VIDEO IF SCREEN	TP5	228V	HORIZ MULT
TP2	0V	3RD VIDEO IF GRID	TP6	0V	GROUND
TP3	-.2V	VIDEO DET	TP7	-.8V	HORIZ AFC
TP4	-1.6V	IF AGC	TP8	250V	B+

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested alignment tools ..... General Cement #8721, 8722
Walsco #2519

Turn the set on and tune in a TV station, preferably with a test pattern. Adjust the Brightness and Contrast controls for a normal picture.

Short out the AFC voltage by connecting a clip lead from TP-7 to chassis. Connect a .1mfd, 400 volt capacitor from TP-5 to chassis.

Adjust Horizontal Hold to the point where the picture is almost stable horizontally.

Remove the capacitor from TP-5 and adjust the Horizontal Frequency slug (B1) to the point where the picture is almost stable horizontally.

Remove the clip lead from TP-7 and chassis. Adjust the Horizontal Hold until the picture is synchronized horizontally.

Adjust the Horizontal Size for a picture slightly wider than necessary to fill the picture mask horizontally.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	3BZ6	
V2	2nd Video IF Amp	3BZ6	
V3	3rd Video IF Amp	3BZ6	
V4	Video Output	12BY7A	
V5	AGC Keying-Noise Limiter-Sync Sep.	3BZ6	
V8	Sound IF Amp.	3CB6	
V7	Audio Det	3DT6	
V8	Audio Output	5AQ5	
V9	Sync Amp -Vert Mult	6CQ7	
V10	Vert. Mult -Vert Output	7EY6	9EF6 *
V11	Horiz Mult	6CQ7	
V12	Horiz Output	21EX6	
V13	Damper	19AU4GT	
V14	HV Rect	4A01	2A3/ 144AH *

* Alternate.

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	MOTOROLA PART No	GENERAL ELECTRIC PART No	RCA PART No	SYLVANIA PART No	
V13	21DAP4	21DEP4 ①	21DAP4 ②	21DAP4 ③	① "Aluminized" ② "Rivercrest" ③ ③ "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA						
	CAP	VOLT	MOTOROLA PART No	AEROVOX PART No	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No	SPRAGUE PART No
C1	140	150	23K745165	AFHS1-23	XA0261	FP117	TMS-24	S-090 MT-1540	TVL-1428
C2A	250	300	23K738749	AFHS4-02-75	D0025	FP419.55			TVL8-4587.1*
B	100	300							
C	250	300							
D	10	300							
C3A	440	300	23K738700 ①	AFH3-106	CSH0	FP388-1	TMT-32	T-382	TVL-3635.5
B	200	300							
C	20	25							

① Alternate Part #23D738700.
* Not normally in distributors stock. Available through distributors on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	MOTOROLA PART No	AEROVOX PART No	CENTRALAB PART No	CORNELL-DUBILIER PART No	MALLORY PART No	SPRAGUE PART No.	
C4	25	100	8K123045	P288N-25		CUB2P25	GEM-3025	2TM-P25	
C5	15		21K120578						
C6	6.2		21K128940	NPO-SI 6.2		C10Y82C			N150 10%
C7	56		21K126699						
C8	10		21K126086						N150 5% N150 10%
C9	470		21K104554	BPD-00047	DD-47	BYA10T47	UC-5347	5GA-T47	
*C	1000		21K737426	EF-001	MFT-1000			5GA-T9	
C11	.75		21K735423					5GA-T8	
C12	22		21K120539						N150 10%
C13	1000		21K15386	BPD-001	DD-102	BYA8S1	DC521	5HK-DI	
C14	580		21K746762	DI-00066	DD-581	L10T56	UC-5356	5GA-T56	
C15A	800		21K400943	BPD-0008	DD-801	L10T8		5GA-T8	
B	800			BPD-0008	DD-801	L10T8		5GA-T8	
C16	1000		21K15386	BPD-001	DD-102	BYA8DI	DC521	5HK-DI	
C17	470		21K746761	BPD-00047	DD-471	BYAU0T47	UC-5347	5GA-T47	
C18A	800		21K400943	BPD-0008	DD-801	L10T8		5GA-T8	
B	800			BPD-0008	DD-801	L10T8		5GA-T8	
C19	5000	1000	21K738298	DAC-9	DD-502	BYA10D5		5GA-D5	
C20	47		21K14307	N750-DI 47	DTN-47	CI0Q47U	NT-5447	5TCU-Q47	N750 10%
C21	27		21K29896			CI0Q27U			N750 10%
C22	.1	400	8K18006	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C23	10000	1400	21K134833	DAC-3T	DD8-103	HVC20D5		20HK-D5	
C24	5000	2000	21K120003		DD30-502	HVC20D5		20HK-D5	
C25	10000	1400	21K134833	DAC-3T	DD8-103	HVE15S1		BL-SI0	
C26	20000		21K741863	BPD-03	DD-203	HVE15S2		5HK-S3	
C27	470	2000	21K12478	HVD-30-470	DD30-471	HVB20T47	DC30347		
C28	25	100	8K124570	P288N-25		CUB2P25	GEM-2025	2TM-P25	
C29	.1	600	8K21006	P488N-1	DF-104	P488N-1	GEM-401	4TM-P1	
C30	2.7		21K125490						
C31	1600		21K12478			1R5IH	MCB386	MS-SI	①
C32	.75		21K735423						
C33	5000	1000	21K738298	DAC-9	DD-502	BYA10D5		5GA-D5	
C34	5000	1000	21K738298	DAC-9	DD-502	BYA10D5		5GA-D5	
C35	5000	1000	21K738298	DAC-9	DD-502	BYA10D5		5GA-D5	
C36	18		21K130578						N150 10%
C37	5000	1000	21K738298	DAC-9	DD-502	BYA10D5		5GA-D5	
C38	5000	1000	21K738298	DAC-9	DD-502	BYA10D5		5GA-D5	
C39	150		21K745777	BPD-00015	DD-151	L10T15	UC-5315	5GA-T15	
C40	.05	600	8K12286	P488N-05	DF-503	CUB6S5	GEM-615	6TM-S5	
C41	10000		21K482736	BPD-01	DD-103	BYA8SI	DC521	5HK-SI	
C42	5000	2000	21K120003		DD30-502	HVC20D5		20HK-D5	
C43	.05	600	8K12286	P488N-05	DF-503	CUB6S5	GEM-615	6TM-S5	
C44	2000		21K12286	BPD-002	DD-203	BYA10D2	DC522	5HK-D2	
C45	220		21K40815	BPD-00022	DD-221	L10T22	UC-5322	5GA-T22	
C46	27		21K19896						N150 10%
C47	.02	600	8K12079	P588N-02	DD-203	CUB6S2	GEM-612	6TM-S2	
C48	.002	600	8K12568	P568N-002	DD-202	CUB6D2	GEM-622	6TM-D2	
C49	.002	600	8K12568	P568N-002	DD-202	CUB6D2	GEM-622	6TM-D2	
C50	5300		21K20432	BPD-0033	DD-332	BYA10D33	UC-5233	5GA-D33	
C51	.01	200	8K12419	P288N-01	DD-103	CUB2S1	GEM-411	2TM-S1	
C52	.015	600	8K737432	P488N-015	DD8-153	CUB6S15	GEM-615	6TM-S15	
C53	10000		21K482736	BPD-01	DD-103	BYA8SI	DC521	5HK-SI	
C54	.01	600	8K12285	P488N-01	DD-103	CUB6S1	GEM-611	6TM-S1	
C55	.03	600	8K12283	P568N-03		CUB6S3	GEM-613	6TM-S3	
C56	.25	100	8K122045	P288N-25		CUB2P25	GEM-2025	2TM-P25	
C57	.03	300	8K123079	P288N-03	DD-203	CUB2S2	GEM-412	2TM-S2	
C58	.03	600	8K123079	P568N-03	DD-303	CUB6S3	GEM-612	6TM-S2	
C59	3000	3000	21K128343	HVD-30-3000	DD30-302	HVB30D3	DC3023		
C60	4700		21K120549	BPD-0047	DD-472	BYA10D47	UC-5247	5GA-D47	
C61	1000		21K19045	BPD-001	DD-102	BYA8DI	DC521	5HK-DI	
C62	1000		21K128045	BPD-001	DD-102	BYA8DI	DC521	5HK-DI	
C63	.05	200	8K121005	P288N-05	DF-503	CUB2S5	GEM-415	2TM-S5	
C64	3300		21K130422	BPD-0033	DD-332	BYA10D33	UC-5233	5GA-D33	

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No	MALLORY PART No	SPRAGUE PART No	
C65	.02	200	8K121003	P288N-02	DD-203	CUB2S2	GEM-412	2TM-S2	
C66	.0039	400	8K125942						10%
C67	100		21K410036	N750-DI 100	DTN-100	CI0T1U	NT-531	5TCU-T1	N750 ②
C68	680		21K736046	1464-00068	D6-681	1R5T68		MS-339	10%
C69	390		21K735757	DI-00039	DD-391	L10T39	UC-5339	5GA-T39	
C70	6000	1000	21K738298	DAC-9	DD-502	BYA10D5		5GA-D5	
C71	.1	600	8K120008	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C72	.1	600	8K12288	P588N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C73	.1	600	8K12288	P588N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C74	.05	1000	8K121570	P1088N-05		CUB10S5	GEM-1015	10TM-S5	
C75	100	3000	21K747539						
C76	5000	1000	21K738298	DAC-9	DD-502	BYA10D5		5GA-D5	
C77	.1	400	8K12006	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	③
C78	1000		21K115386	BPD-001	DD-102	BYA8DI	DC521	5HK-DI	
C79	130	5000	21K121253						10% ③
C80	1000		21K15386	BPD-001	DD-102	BYA8DI	DC521	5HK-DI	
C81	1000		21K410127	BPD-001	DD-102	BYA8DI	DC521	5HK-DI	
C82	1000		21K410127	BPD-001	DD-102	BYA6DI	DC521	5HK-DI	
C83	.15	400	8K12174	P488N-15		CUB4P15	GEM-4015	4TM-P15	
C84	1500	3000	21K12428	HVD-30-1500	DD30-152	HVB30D15	DC3015		
C85	5000	1000	21K738298	DAC-9	DD-502	BYA10D5		5GA-D5	④

① Some versions may use 1500mmf in this application (Part #21K124298).
② Some versions may use 150mmf in this application (Part #21K745777).
③ Some versions may use 1000mmf in this application (Part #21K128045).
④ Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	250Ω	½	18K746764				UR678	Contrast
B	2meg	½						Volume, Tap ① 1.3meg
C	Switch							Push-Push Type
R2A	100K		18C745765	B-40	A47-100K-S	QU-128	U41	Brightness
B	Shaft			Not Req.	K38-3	Not Req.	Not Req.	
R3A	2meg		18K746766	B-75	A47-2meg-S	QU-130	U56	Vert. Hold
B	Shaft			Not Req.	K38-3	Not Req.	Not Req.	
R4A	4meg		18K745634	AB-98 †	A47-4meg-S†		PTA356L	Vert. Size
B	Shaft			AK-19	RN-3		Not Req.	
R5A	2meg		18K745523	AB-75 †	B47-2meg-S	QU-139 †	PTA28L	Vert. Lin.
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R6A	100K		18K739549	AB-40 †	B47-100K-S	QU-128 †	PTA15L	Horiz. Hold
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R7	5000Ω	2(WW)	17B746869					Horiz. Size

† Enlarge mounting hole to 3/8".

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R8	1.5meg 5%		6K127000	
R9	8200Ω	2	6R5610	
R10	2200Ω		6R6069	
R11	1000Ω		6K127960	
R12	8200Ω	3	17K733283	
R13	39Ω		6K122225	①
R14	8200Ω		6K119931	
R15	8200Ω	3	17K733283	
R16	47Ω		6K127542	
R17	1000Ω		6K127960	
R18	15K		6K119934	②
R19	1200Ω		6K119925	
R20	680K		6K119930	
R21	10K	3	17K744464	
R22	350Ω		6K128226	
R23	3900Ω		6K125535	
R24	5800Ω	10	17K747879	
R25	56K		6K127541	
R26	220K		6K123232	
R27	100K		6K125534	
R28	1000Ω			5GA-D5
R29	10K			5GA-D5
R30	68K		6R6001	5GA-D5
R31	39K		6K12704	
R32	47K		6K121299	
R33	820K		6K128320	
R34	2.2meg		6K127901	
R35	15meg 5%		6K125891	
R36	47K	4	17K743157	
R37	330K		6K127954	
R38	4700Ω		6K121847	
R39	47K		6K121299	③
R40	220Ω		6K127699	
R41	1000Ω		6K127960	
R42	62K		6K125179	
R43	560K		6K126528	
R44	560Ω		6K122802	
R45	470K		6K121279	
R46	680K		6K126529	
R47	2200Ω		6R6290	
R48	220Ω		6K125471	
R49	100Ω		6K119402	
R50	22K	1	6K121894	
R51	330Ω	1	6R6254	
R52	470Ω	2	6K125146	
R53	18K		6K122848	
R54	8.2meg		6K119407	
R55	470K		6K121279	

ITEM No.	RATING		MOTOROLA PART No.	NOTES
	OHMS	WATT		
R56	2.2meg		6K127001	
R57	560K		6K126228	
R58	56K		6K127541	
R59	180K		6K125531	
R60	1200Ω		6R6069	
R61	18K		6K125531	
R62	5.6meg		6K124781	
R63	1meg		6K123324	
R64	680K		6K128229	
R65	15K		6K119934	
R66	2700Ω		6K119926	
R67	82K		6K119933	
R68	22K		6K119935	
R69	220K		6R6015	
R70	470K		6K119406	
R71	150Ω	1	6R6330	
R72	33K		6K127633	
R73	330Ω		6K127940	
R74	330Ω		6K127940	
R75	9.6Ω		6K746630	
R76	47K	1	6K12901	
R77	2200Ω		6R6089	
R78	12Ω	1	6K127508	
R79	100K		6K125534	
R80	100K		6K125534	
R81	4.7meg		6K123326	
R82	9300Ω		6K119931	
R83	39K		6K125535	
R84	220K		6K123232	
R85	56K		6K127541	
R86	1000Ω		6K121301	
R87	6800Ω		6K119930	
R88	4meg		6K124494	
R89	470Ω		6K127633	
R90	6800Ω	5	17K739135	
R91	220K		6K123232	
R92	1meg		6K124494	
R93	4.7Ω		17K77629	
R94	22K	1	6K121894	
R95	20Ω 5%	10	17K735320	
R96	13.5Ω 5%	20	17C747591	
R97	47K		6K121897	
R98	10K	3	17K744484	
R99	3900Ω		6K125535	
R100	220K		6R6015	
R101	2.2meg		6R3927	
R102	1500Ω	2	6K121896	

① Some versions may use 47Ω in this application (Part #6K127542).
② Not used in versions with chassis coding preceding A-03.
③ In chassis with coding preceding A-06 a 12K is used in this application (Part #6K119933).

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MOTOROLA PART No	Meissner PART No	Merit PART No	Miller PART No	Ram PART No	
L1	Ant. Coil	24A742792					
L2	47.25MC Trap	24C747584	TV-153 *				
L3	39.75MC Trap	24K747563	TV-152				
L4A	1st. Video IF	24K747586					
B	41.35MC Trap						5GA-739
L5	47.25MC Trap	24K747585	TV-153 *				
L6	2nd. Video IF	24K747587	17-4522	TV-130	6219	VF-3	
L7	3rd. Video IF	24K747587	17-4522	TV-130	6219	VF-3	
L8	4th. Video IF	24K746754					Includes M5
L9	Resonant Choke	24R119889					8.5 Microhenries
L10	Resonant Choke	24K746772					1.8 Microhenries, Note 1
L11	Series Peaking Coil	24K746441	19-3100 ▲	TV-181 ▲	6118 ▲	VP-3a	100 Microhenries, wound on 5600Ω resistor
L12	Resonant Choke	24R119889					8.5 Microhenries
L13	Shunt Peaking Coil	24D743006	19-3180	TV-184	6180	VP-5	180 Microhenries, Note 2
L14	4.5MC Trap	24K739290	20-1004	TV-151	1469 *	SF-3	
L15	Series Peaking Coil	24K746671	19-3300 ▲	TV-200 ▲	6132 ▲	VP-7 ▲	330 Microhenries, wound on 5600Ω resistor
L16	Shunt Peaking Coil	24K744410		TV-202	6156		400 Microhenries, Note 2
L17	Shunt Peaking Coil	24K743540					1400 Microhenries, wound on 3700Ω resistor
L18	Resonant Choke	24R119889					8.5 Microhenries
L19	Resonant Choke	24K746772					1.8 Microhenries, Note 1
L20	1st. Sound IF	24B743463					Tapped ① 1.8Ω
L21	2nd. Sound IF	24B739343	17-3496 *	TV-113 *	6203 *	SF-2 *	
L22	Quadrature Coil	24K743031					Includes 18mmf Cap.
L23	Fil. Choke	24K743675	19-1001	BC-562	4604		1.5 Microhenries
L24	Fil. Choke	24K743675	19-1001	BC-562	4604		1.5 Microhenries
L25	RF Choke	24B747171			4611		7.5 Microhenries
L26	RF Choke	24B747171			4611		7.5 Microhenries

Note 1. IRC Part #CLA.
Note 2. Chassis coded A-00 use 500 Microhenries in this application (Part #24K746872).

* Disregard tap.
▲ Parallel with 5600Ω resistor.
* Disconnect C36.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC	MOTOROLA PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	Thordarson PART No.	
L27	40Ω		24K743426	19-1576 ■	TV-165 ▲	6210 ■	H-102 ■	H3-5 ■	■ Enlarge mounting hole. ▲ Disregard tap.

FILTER CHOKE

ITEM No.	RATINGS		REPLACEMENT DATA							
	CURRENT (Measured)	DC RES	INDUCTANCE (0 CURRENT 1000 ^)	MOTOROLA PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
L28	.395A	28Ω	1 Hy.	25K747167						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							
		MOTOROLA PART No.	Halldorson PART No	Merit PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordarson PART No	Triad PART No
T1	Vert. Output	25K746756	21900 ①②				VO-100		A-116X ③
T2	Yoke-Horiz. (19MM) (SIO²)-Vert. (38MM)	24D746645 ④						Y-53 ⑤	
	Alt. Yoke	24K746811							
	Rear Cover ⑥	59A742818							
	Centering Device								
	Yoke Clamp	42A742819							
T3	Horiz. Output	24K746570 ⑥							
	Primary Coil	24K746571							
	Secondary Coil	24K745108							

① Connect as autoformer.
② Use 8 : 1 turns ratio.

④ Includes yoke plug.
⑤ Remove 27mmf capacitor across terminals #2 and #7. Connect yoke terminal #2 to yoke plug pin #4, yoke terminals #1 and #3 to yoke plug pin #5, and yoke terminal #7 to yoke plug pin #6.
⑥ Complete transformer assembly.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No	
T4	5000Ω	3-4Ω	25K743210	Z1107	A-2930	AU-601	A-3877	24S51	S-3X	① Alternate part no recommended by manufacturer for replacement.
	5000Ω	3-4Ω	25D738848 ①	Z1107	A-2930	AU-601	A-3877	24S51	S-3X	

SPEAKER

ITEM No.	TYPE				REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP		MOTOROLA PART No.	QUAM PART No	
SP1	4" x 6"	PM	3-4Ω		50D745672	46A15	

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K1	Tone Compensation Circuit	220mmf, 5000mmf, 3300mmf, 68K	51B747486	
K2	Horiz. Sweep Network	120mmf ⓐ 2500V, 120mmf ⓐ 2500V, 6800Ω	51K748204 ①	

① Some versions may use individual components with values of 390mmf ⓐ 2000V, 390mmf ⓐ 2000V and 6800Ω in this application.

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	MOTOROLA PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.395A	48C743273 ①	HF504 ①	1N1008 ②	SD-500 ①	M500 ①	① Silicon Type.
M2	.395A	48C743273 ①	HF504 ①	1N1008 ②	SD-500 ①	M500 ①	② Germanium Type.
M3		48B742698 ③	K1616C ③		SD-91 ①④		③ Selenium Type.
							④ 2 Used.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4	N	1 3/4A-125V-S/B	65K746971	9K744239	3331.75 (N-1 3/4A-125V-S/B)	346016	N 1 3/4	HN 1 3/10 to 1 3/4

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MOTOROLA PART No.	CBS PART No.	SYLVANIA PART No.	
M5	820	48K747380	1N60	1N295	Video Detector (Clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M6	Lamp	65K746835	#NE51
M7	Tuner	1U747467	VHF With UHF Provisions (TT-110YC) Ch. PTS-546Y
	Tuner	1U747464	VHF (TT-110) Ch. PTS-546
M8	Tuner		UHF (VTT-89) Ch. PTS-546Y
M9	Thermal Switch	6K747179	Includes resistor 265Ω cold, 6Ω hot.

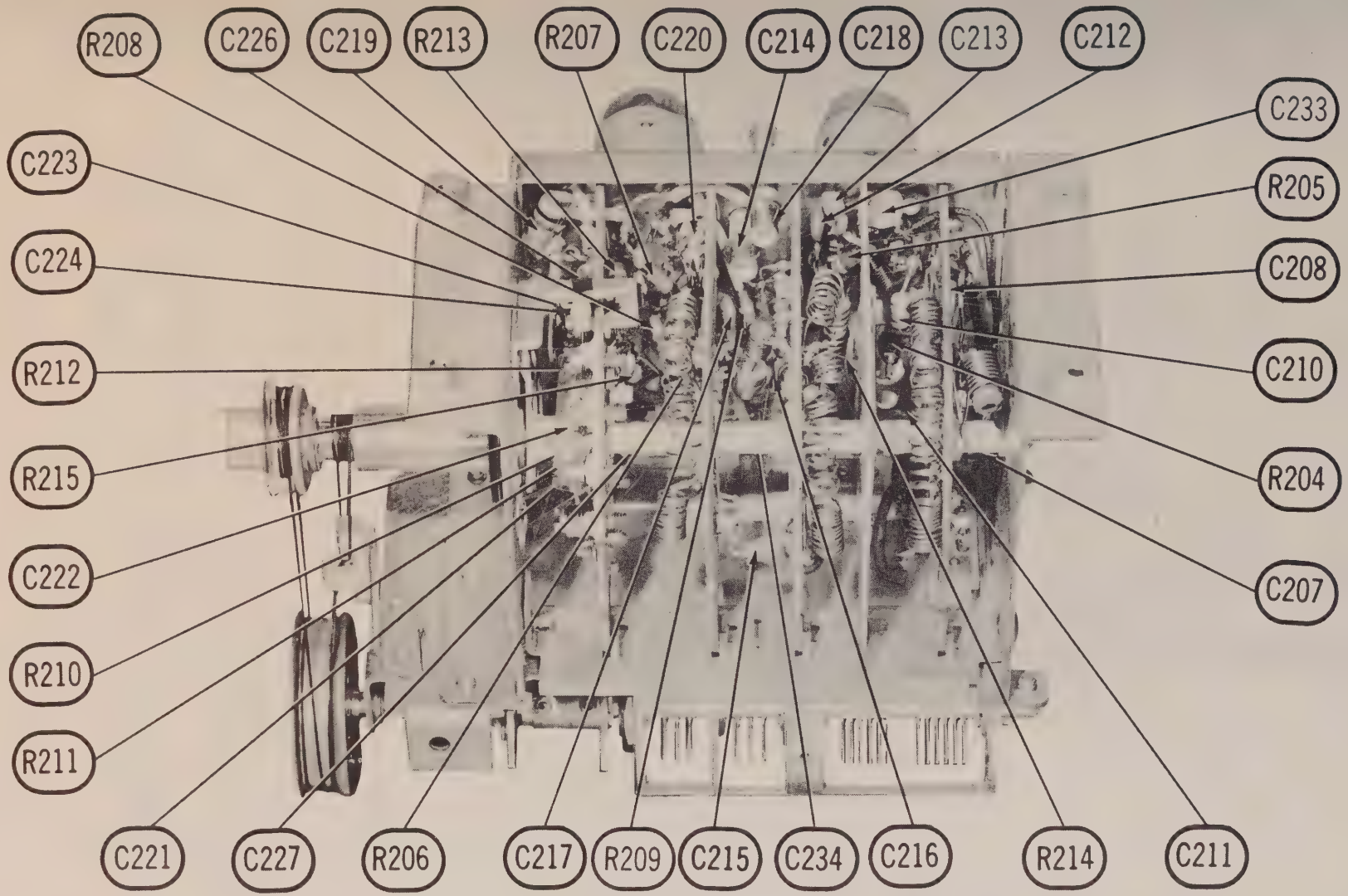
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

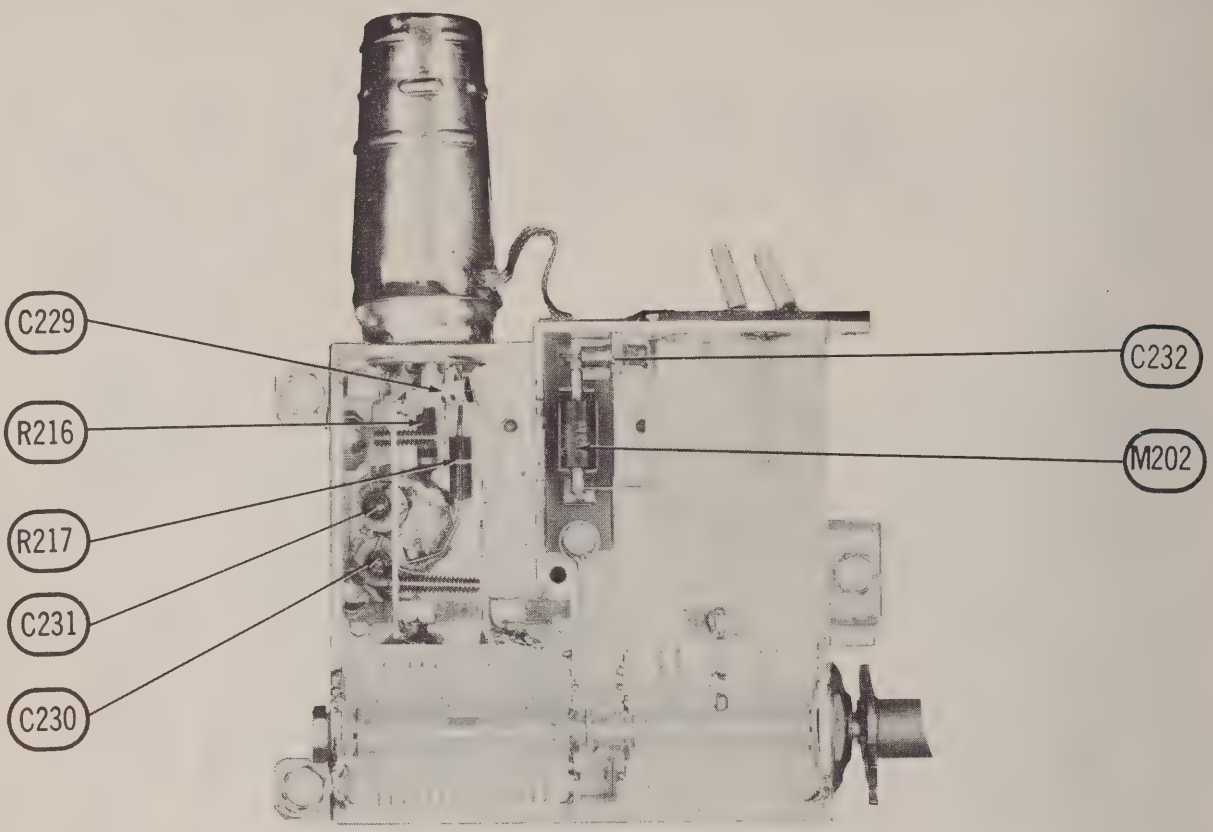
NAME	PART NO.	DESCRIPTION
Safety Glass	61C746786	
Bezel	13F745223	Models Y21P1B, 21P1B
Bezel	13K745225	Models Y21P1BR, 21P1BR
Bezel	13K746647	Models Y21P1GY, 21P1GY
Knob	36K747038	VHF Channel Selector, Models 21P1B, BR, & GY
Knob	36K747037	VHF Channel Selector, Models Y21P1B, BR & GY
Knob	36C742871	Fine Tuning
Scale	34K743564	UHF Dial
Knob	36B742692	On-Off-Volume
Knob	36K746755	Brightness, Vert. Hold
Knob	36B742691	Contrast
Cabinet	16K746659	Models Y21P1B, 21P1B
Cabinet	16F745985	Models Y21P1BR, 21P1BR
Cabinet	16K746660	Models Y21P1GY, 21P1GY
Antenna	1V746989	Complete

WIRING DATA

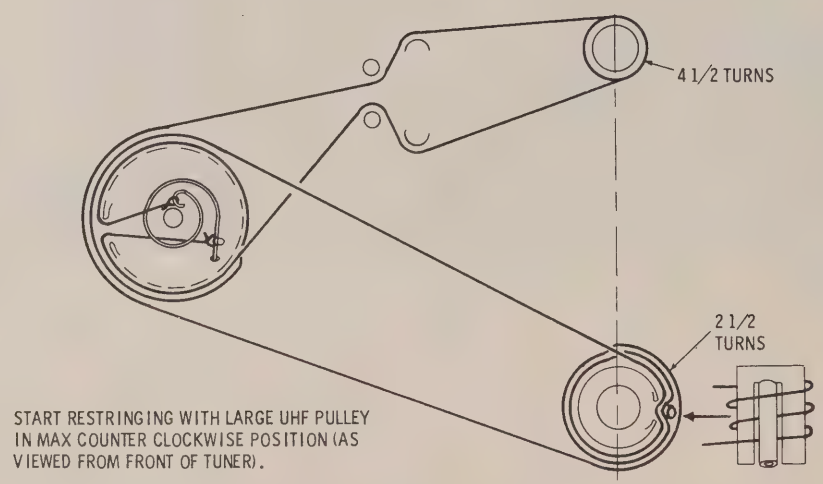
High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor



TUNER 1U747467 - CAPACITOR & RESISTOR IDENT



UHF TUNER VTT-89



UHF DRIVE CORD STRINGING

TUNER ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

The tuner shield must be in place when adjusting the oscillator.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A220	Adjust to place sound marker in trap notch as in Fig. 203. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A221	
			201MC	199.25MC 203.75MC	11		A222	
			195MC	193.25MC 197.75MC	10		A223	
			189MC	187.25MC 191.75MC	9		A224	
			183MC	181.25MC 185.75MC	8		A225	
			177MC	175.25MC 179.75MC	7		A226	
			85MC	83.25MC 87.75MC	6		A227	
			79MC	77.25MC 81.75MC	5		A228	
			69MC	67.25MC 71.75MC	4		A229	
			63MC	61.25MC 65.75MC	3		A230	
			57MC	55.25MC 59.75MC	2		A231	

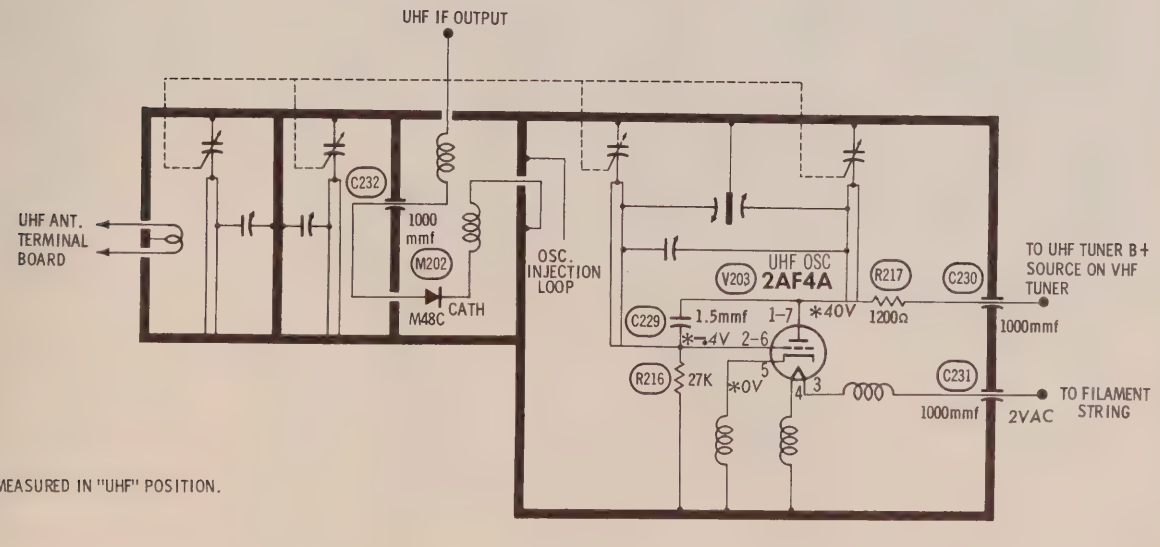
UHF IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	50Ω Carbon Resistor	High side to point Ⓥ. Low side to chassis.	44MC	41.25MC 45.75MC	UHF	Vert. Amp. thru 47K to point Ⓤ. Low side to chassis.	A232, A233	Adjust for maximum gain and symmetry of response similar to Fig. 204 with markers as shown.
13.	Disconnect sweep generator and short antenna terminals.				"	USE VTVM. Across Video Detector load.	A234	Adjust for maximum DC noise voltage.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



* MEASURED IN "UHF" POSITION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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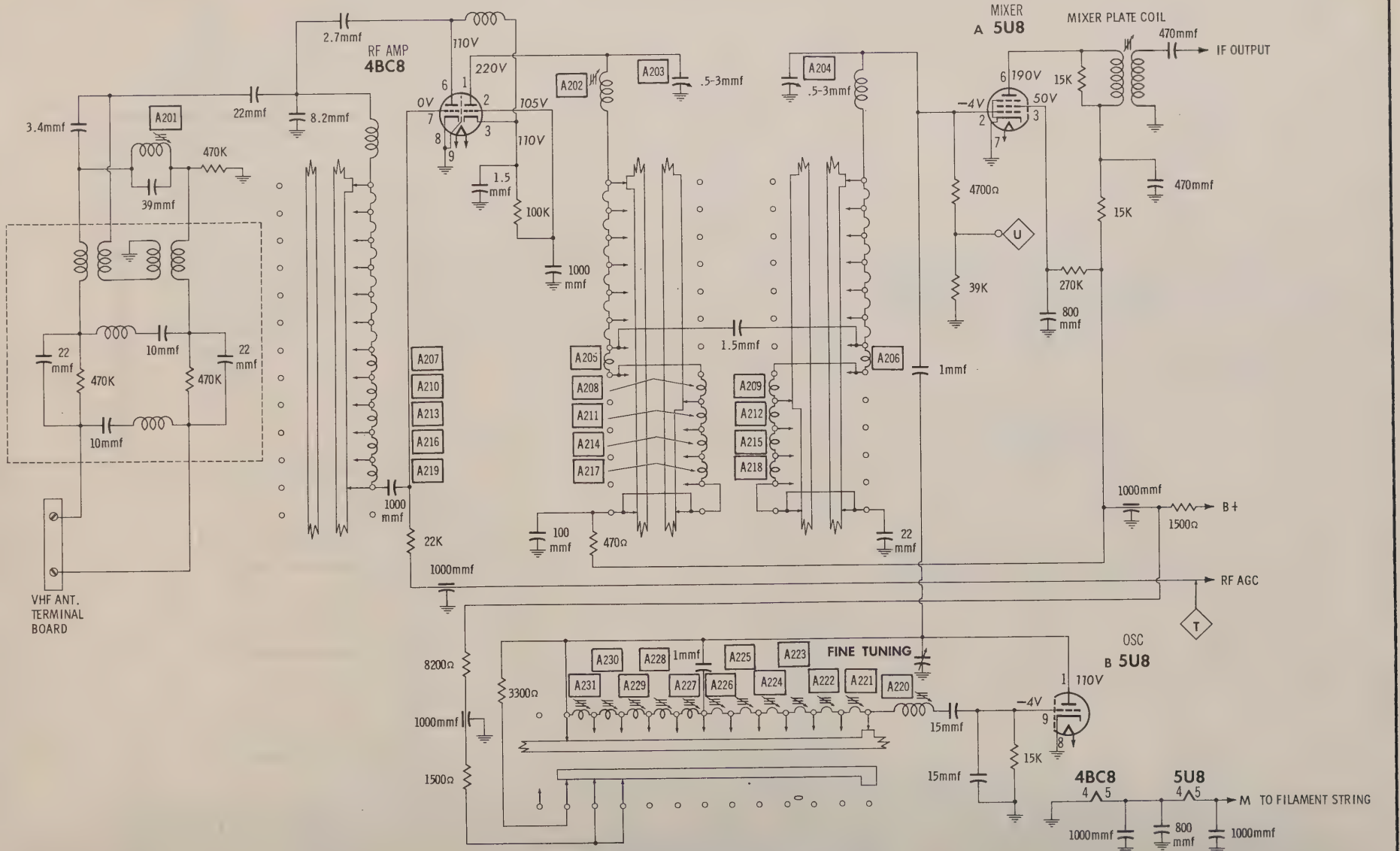
UHF TUNER VTT-89



CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER 1U747464 (TT-110)

CHASSIS TOP VIEW

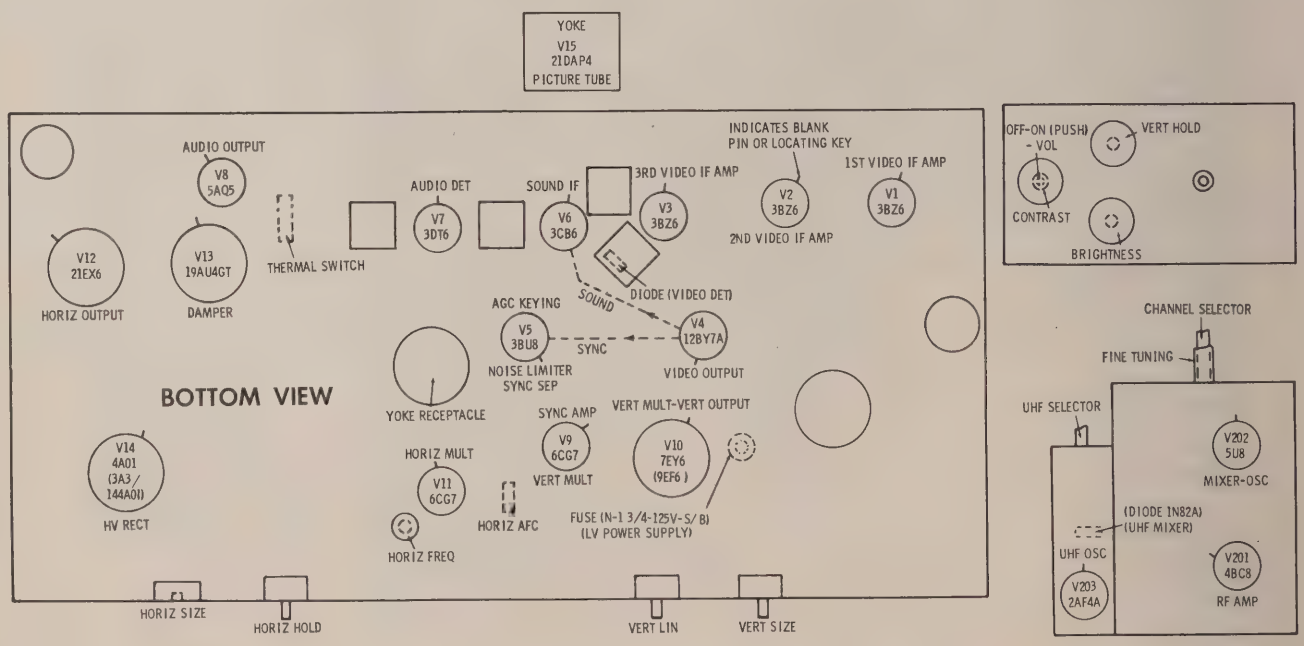
MOTOROLA MODELS Y21P1B,
BR, GY, 21P1B, BR, GY (Ch. PTS-546, Y)

FOLDER 2

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	650K	39Ω	10Ω	11Ω	†8200Ω	†8200Ω	0Ω		
V2	3BZ6	650K	47Ω	10Ω	9.5Ω	†8200Ω	†8200Ω	0Ω		
V3	3BZ6	1200Ω	120Ω	9.5Ω	9Ω	†10K	†10K	0Ω		
V4	12BY7A	•220Ω	3900Ω	0Ω	7.5Ω	7.5Ω	9Ω	†4800Ω	†10K	0Ω
V5	3BU8	†3900Ω	‡47K	2.5meg	3.5Ω	3Ω	†39K	‡870K	‡2.4meg	‡3.8meg
V6	3CB6	4700Ω	220Ω	7.5Ω	6.5Ω	†11K	†70K	0Ω		
V7	3DT6	7.5Ω	560Ω	6Ω	6.5Ω	‡1.4meg	†23K	560K		
V8	5AQ5	0Ω	330Ω	13Ω	14Ω	†880Ω	†570Ω	0Ω		
V9	6CG7	•‡3meg	•1.5meg	0Ω	12Ω	13Ω	†35K	50K	2200Ω	0Ω
V10	7EY6	NC	11Ω	†430Ω	†150Ω	•1.4meg	NC	12Ω	0Ω	
V11	6CG7	†12K	5meg	1000Ω	4.5Ω	3.5Ω	†60K	•70K	1000Ω	NC
V12	21EX6	NC	18Ω	0Ω	TP	1meg	TP	14Ω	•†7700Ω	TOP CAP ‡14.5Ω
V13	19AU4GT	NC	TP	¶7meg	NC	†4.5Ω	TP	18Ω	23Ω	
V14	4A01	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡255Ω
V15	21DAP4	4.5Ω	80K	1meg	0Ω	NC	NC	•250K	6Ω	
V201	4BC8	†2000Ω	INF	INF	1.5Ω	.5Ω	INF	3meg	0Ω	0Ω
V202	5U8	†14K	44K	†270K	1.5Ω	3Ω	†19K	0Ω	0Ω	15K
V203	2AF4A	†12K	25K	.5Ω	0Ω	.1Ω	25K	†12K		
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 250V SOURCE.
‡ MEASURED FROM PIN 3 OF V13. NC NO CONNECTION.
* MEASURED IN "UHF" POSITION. TP TIE POINT.



TUBE PLACEMENT CHART

PHOTOFACT* Folder

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TRUETONE
MODEL 2DC3840A

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

TRUETONE
MODEL 2DC3840A

TRUETONE
MODEL 2DC3840A

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SET 421 FOLDER 3

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

TRUETONE
MODEL 2DC3840A

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type knobs from the top.
2. Remove 5 metal screws holding the rear cover. Remove the rear cover.
3. Remove 2 metal screws holding the front. Pull front out at bottom and lift up. Remove safety glass.
4. Remove 2 metal screws holding the antenna terminal board.
5. Remove the 2 trim strips from the sides.
6. Remove 8 metal screws holding the top of the cabinet. Remove the speaker leads and the top.
7. Remove 2 hex nuts and 1 bolt holding resistor terminal board.
8. Remove 2 metal screws holding the AC interlock.
9. Remove the picture tube socket, yoke plug and HV lead.
10. Remove 2 side chassis bolts and 2 bottom chassis bolts.
11. Remove the chassis.

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

TRADE NAME	Truetone MODEL 2DC3840A
SUPPLIER	Western Auto Supply Co., 2107 Grand Avenue, Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	Seventeen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 170 Watts, 1.65 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF Oscillator is possible by removing the rear cover, and supply power to the receiver. Set the Fine Tuning at the center of its range. The adjustments are accessible, one at a time, thru a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 2 metal screws from the bottom edge of the front. Pull front out at the bottom and lift up to remove.

SPECIAL ADJUSTMENTS

A. Focus
No provision is made to vary the focus on this receiver.

B. Range
Observe the picture and advance the Range Control to a point where the picture distorts or a buzz is heard in the sound. Back off from this setting until the picture becomes stable with no noise in the sound.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the Horizontal Oscillator, it is necessary to remove the rear cover and supply power to set. Set the Horizontal Hold at the center of its range and adjust the Horizontal Frequency slug (B1) until the picture synchronizes horizontally. (For location, see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the buzz control for MINIMUM buzz and maximum sound. (For location, see tube placement chart.)

FUSE DEVICE

A Circuit Breaker is used for LV power supply protection, and may be reset by depressing the reset button. (For location, see tube placement chart.)

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

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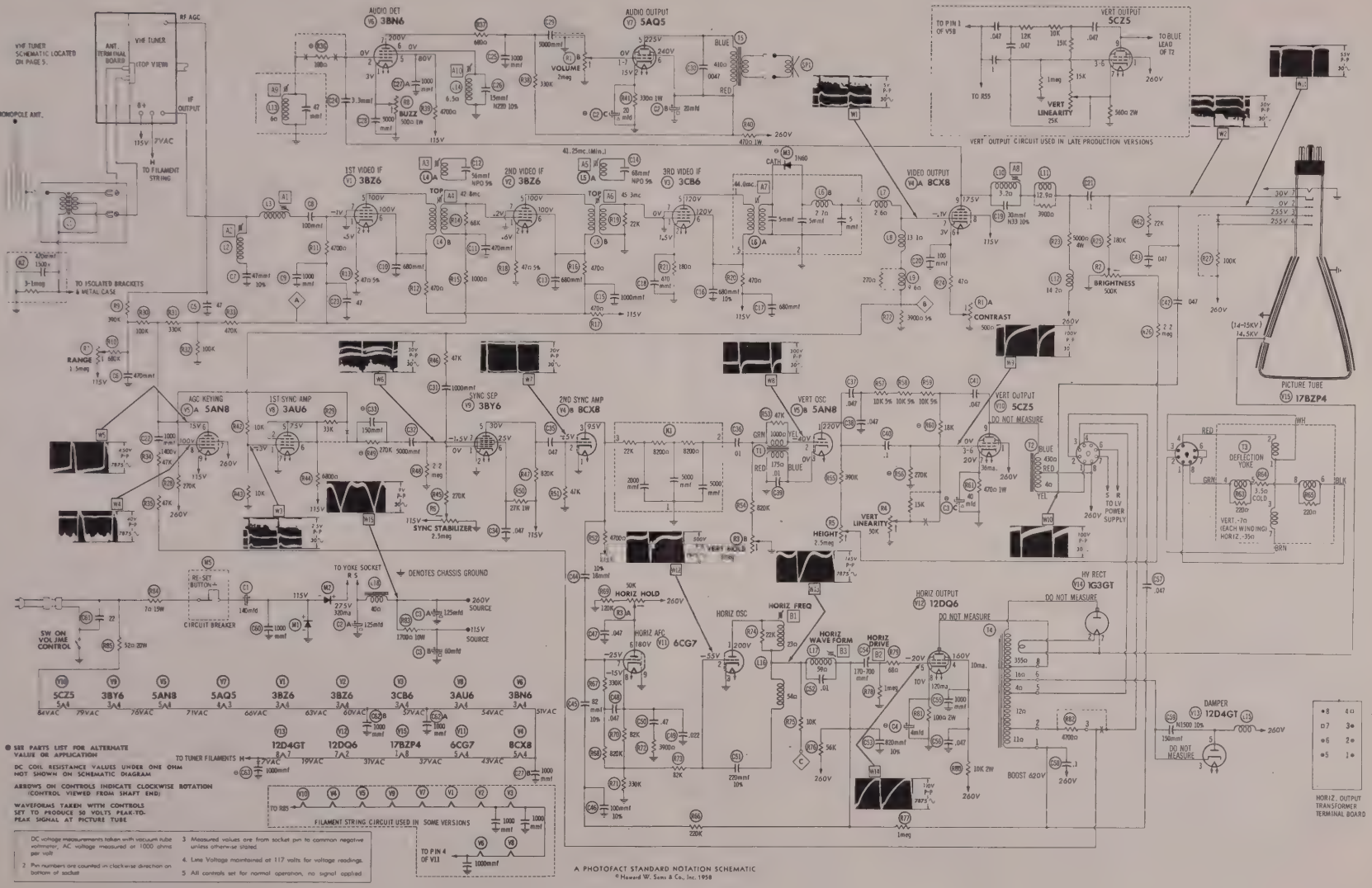
H715R

TRUETONE
MODEL 2DC3840A

TRUETONE
MODEL 2DC3840A

SET 421 FOLDER 3


TRUETONE
MODEL 2DC3840A
FOLDER 3
AUDIO DET V6 3BN6
AUDIO OUTPUT V7 5AQ5
VOLUME 2meg
VERT OUTPUT 5CZ5
VERT OUTPUT CIRCUIT USED IN LATE PRODUCTION VERSIONS
VERT LINEARITY 25K
1ST VIDEO IF V1 3BZ6
2ND VIDEO IF V2 3BZ6
3RD VIDEO IF V3 3CB6
VIDEO OUTPUT V4A 8CX8
CONTRAST 500K
BRIGHTNESS 500K
PICTURE TUBE V15 17BZP4
AGC KEYING V5A 5AN8
1ST SYNC AMP V5B 3AU6
SYNC SEP V9 3BY6
2ND SYNC AMP V4B 8CX8
SYNC STABILIZER 2.5meg
VERT OSC V5B 5AN8
VERT OUTPUT V10 5CZ5
DO NOT MEASURE
VERT LINEARITY 30K
HEIGHT 2.5meg
TO LV POWER SUPPLY
DEFLECTION YOKE
HV RECT Y14 1G3GT
HORIZ OUTPUT V12 12DQ6
HORIZ OSC
HORIZ FREQ
HORIZ AFC V11 6CG7
HORIZ WAVE FORM
HORIZ DRIVE
HORIZ HOLD 50K
DAMPER V13 12D4GT
BOOST 620V
HORIZ. OUTPUT TRANSFORMER TERMINAL BOARD
VHF TUNER SCHEMATIC LOCATED ON PAGE 5.
ANT. TERMINAL BOARD
VHF TUNER
(TOP VIEW)
RF AGC
IF OUTPUT
MONOPOLE ANT.
115V 2VAC
TO FILAMENT STRING
TO ISOLATED BRACKETS & METAL CASE
RANGE 1.5meg
SW ON VOLUME CONTROL
RE-SET BUTTON
CIRCUIT BREAKER
TO YOKE SOCKET
DENOTES CHASSIS GROUND
260V SOURCE
115V SOURCE
SYNC STABILIZER
VERT HOLD
BUZZ 500Ω 1W
TO TUNER FILAMENTS
FILAMENT STRING CIRCUIT USED IN SOME VERSIONS
TO R85
TO PIN 4 OF V11
TO PIN 1 OF V58
TO R55
TO BLUE LEAD OF T2
5CZ5 5A4 84VAC
3BY6 3A4 79VAC
5AN8 5A4 76VAC
5AQ5 4A3 71VAC
3BZ6 3A4 66VAC
3BZ6 3A4 63VAC
3CB6 3A4 60VAC
3AU6 3A4 57VAC
3BN6 3A4 54VAC
51VAC
12D4GT 8A7 27VAC
12DQ6 7A7 19VAC
17BZP4 1A8 31VAC
6CG7 3A4 37VAC
8CX8 5A4 43VAC
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
Pin numbers are counted in clockwise direction on bottom of socket
Measured values are from socket pin to common negative unless otherwise stated
Line Voltage maintained at 117 volts for voltage readings.
All controls set for normal operation, no signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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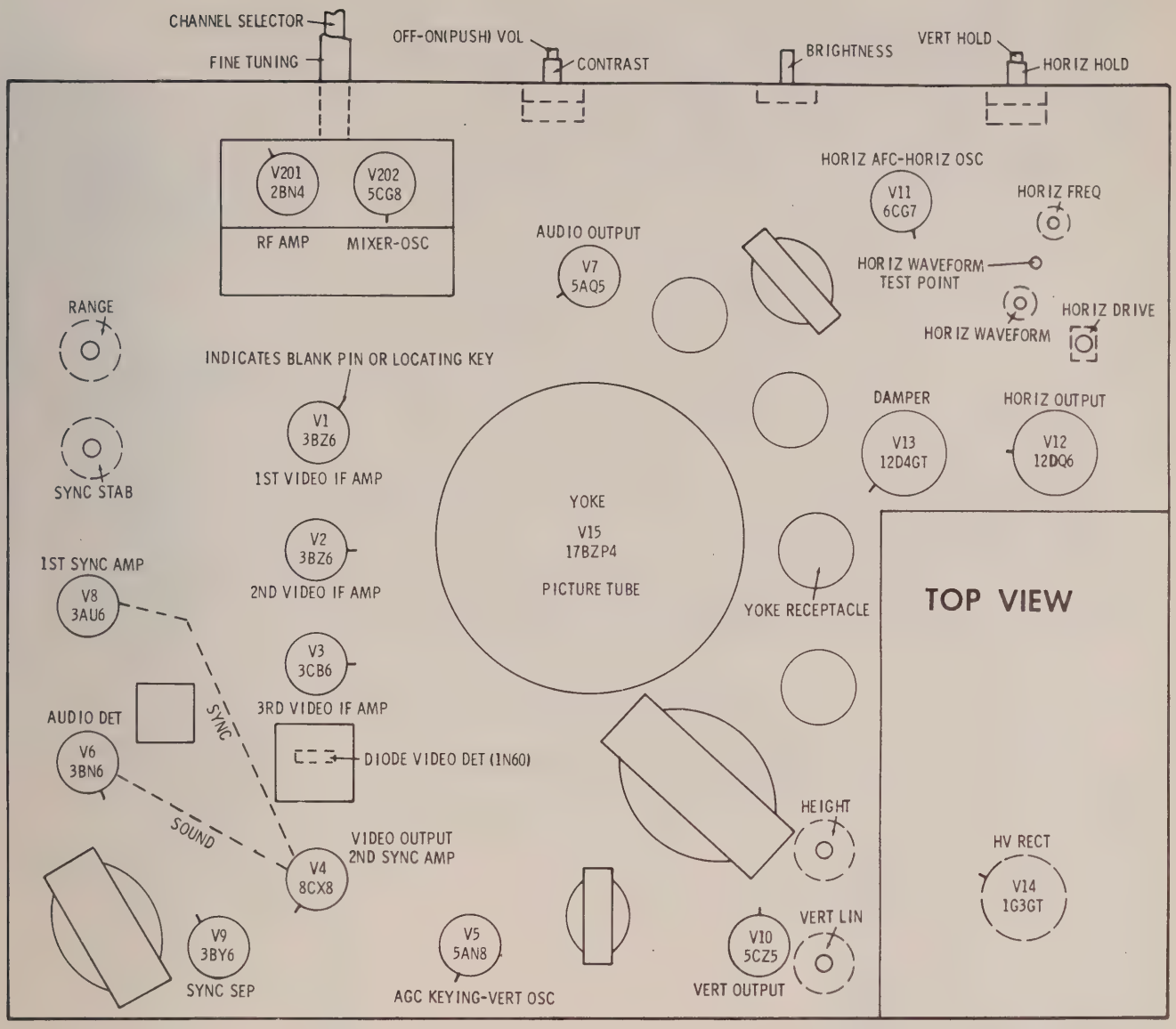
TUBE PLACEMENT CHART



TRUETONE
MODEL 2DC3840A

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

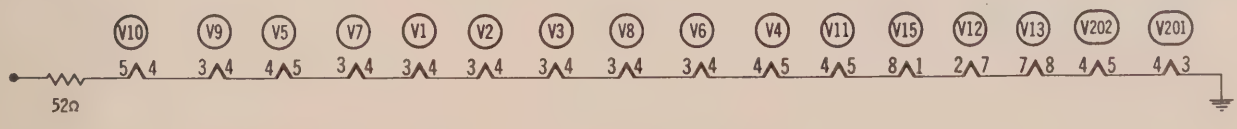
POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker (M5), Rectifiers (M1, M2)

SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V15
No vertical deflection V5, V10
Poor vert. linearity or foldover V5, V10
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, M1, M2
Vert. off freq. V5
Horiz. off freq. V11

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (M3), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V6, V7
Overloaded picture V5

SYNC FAILURE
No vert. sync V8, V9, V4
No horiz. sync V8, V9, V4, V11
No vert. or horiz. sync V8, V9, V4

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



FOLDER 3

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point (A) . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over Mixer-Osc. tube (V202). Low side to chassis.	43.5MC (15MC Swp)	41.25MC 45.75MC 47.25MC	Any non-interfering channel	Vert. Amp. thru detector probe (Fig.1) to pin 5 (plate) of 1st. Video IF Amp. (V1). Low side to chassis.	A1, A2, A3, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. A1 and Mixer Plate Coil control shape of curve top and position of 45.75MC marker. Adjust A2 to position 41.25MC marker and A3 to position 47.25MC marker.
2.	"	"	Not used	42.8MC (Unmod)	"	USE VTVM. DC probe to point (B). Common to chassis (Across Video Det. Load)	A4	Adjust for maximum gain.
3.	"	"	"	41.25MC	"	"	A5	Adjust for MINIMUM deflection.
4.	"	"	"	45.3MC	"	"	A6	Adjust for maximum deflection.
5.	"	"	"	44.0MC	"	"	A7	"

4.5MC TRAP ALIGNMENT

Restore receiver to normal operation and tune in a TV station. Adjust Fine Tuning until a beat pattern is noted in the picture. Adjust A8 until the horizontal scanning lines are smooth and continuous.

SOUND IF ALIGNMENT

Tune in a TV signal and adjust controls for normal operation. Reduce the signal strength by connecting an adjustable attenuator in series with the antenna lead. Attenuate signal until a hiss is heard in the sound similar to super-regeneration. Adjust A9, A10 and the Buzz Control (R8) for maximum undistorted sound with MINIMUM buzz.

TUNER ALIGNMENT INSTRUCTIONS LOCATED ON PAGE 12.

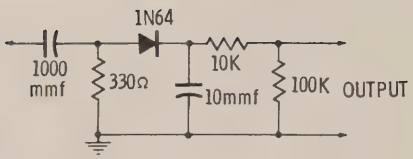


FIG.1

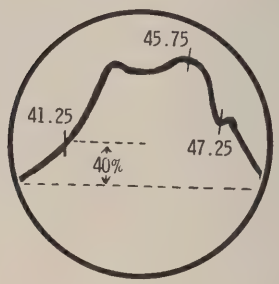
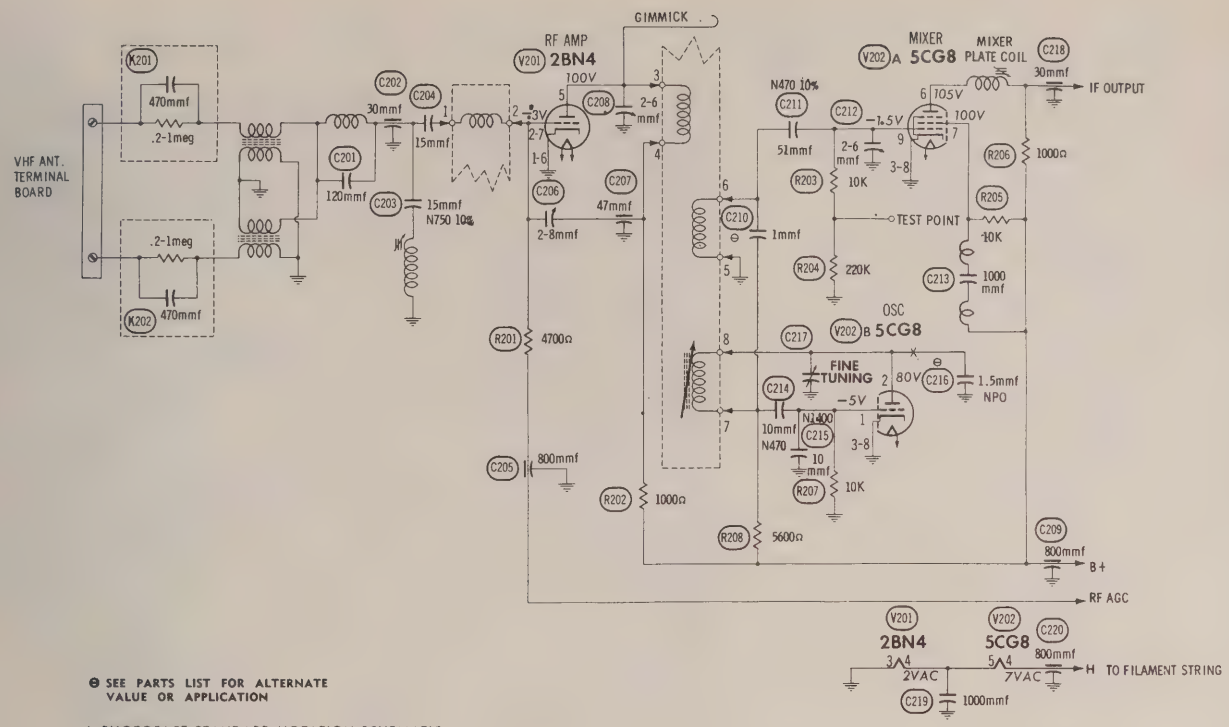


FIG. 2



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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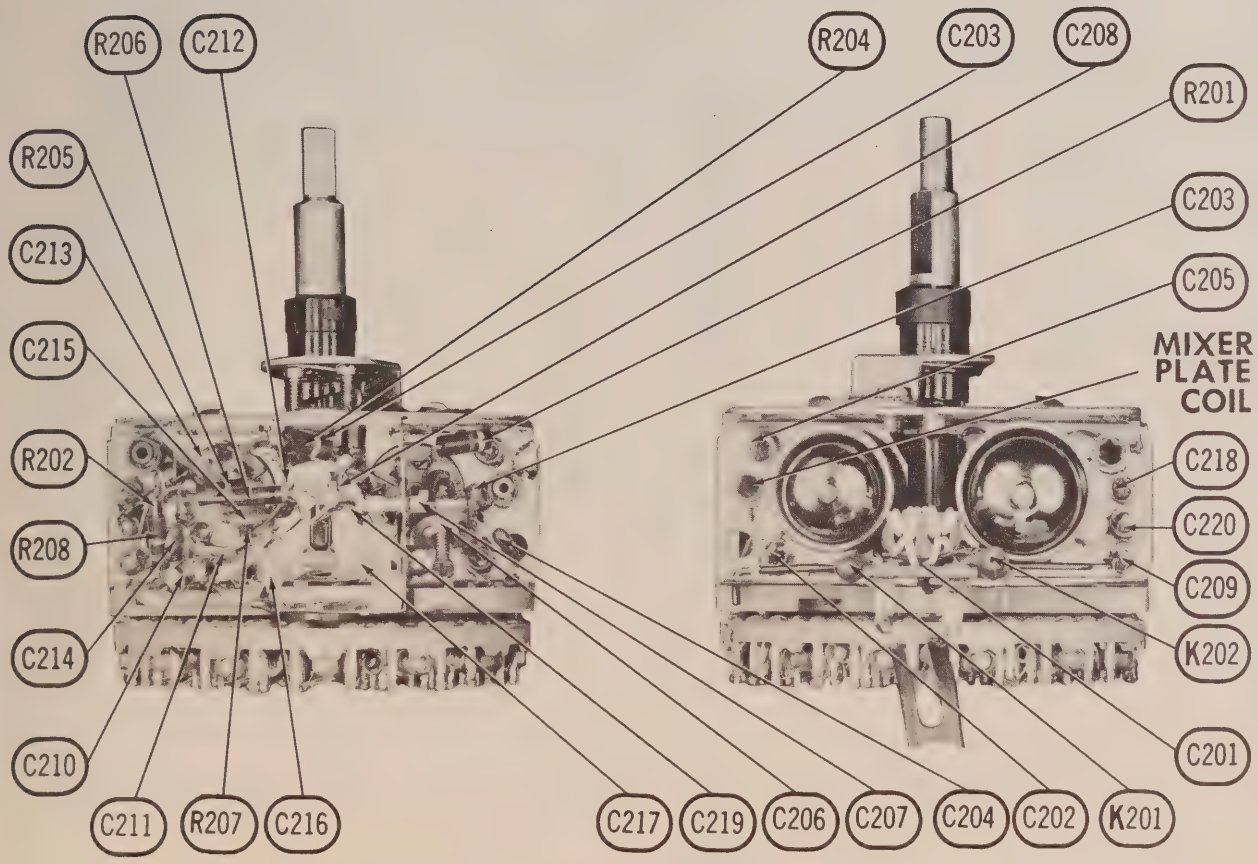
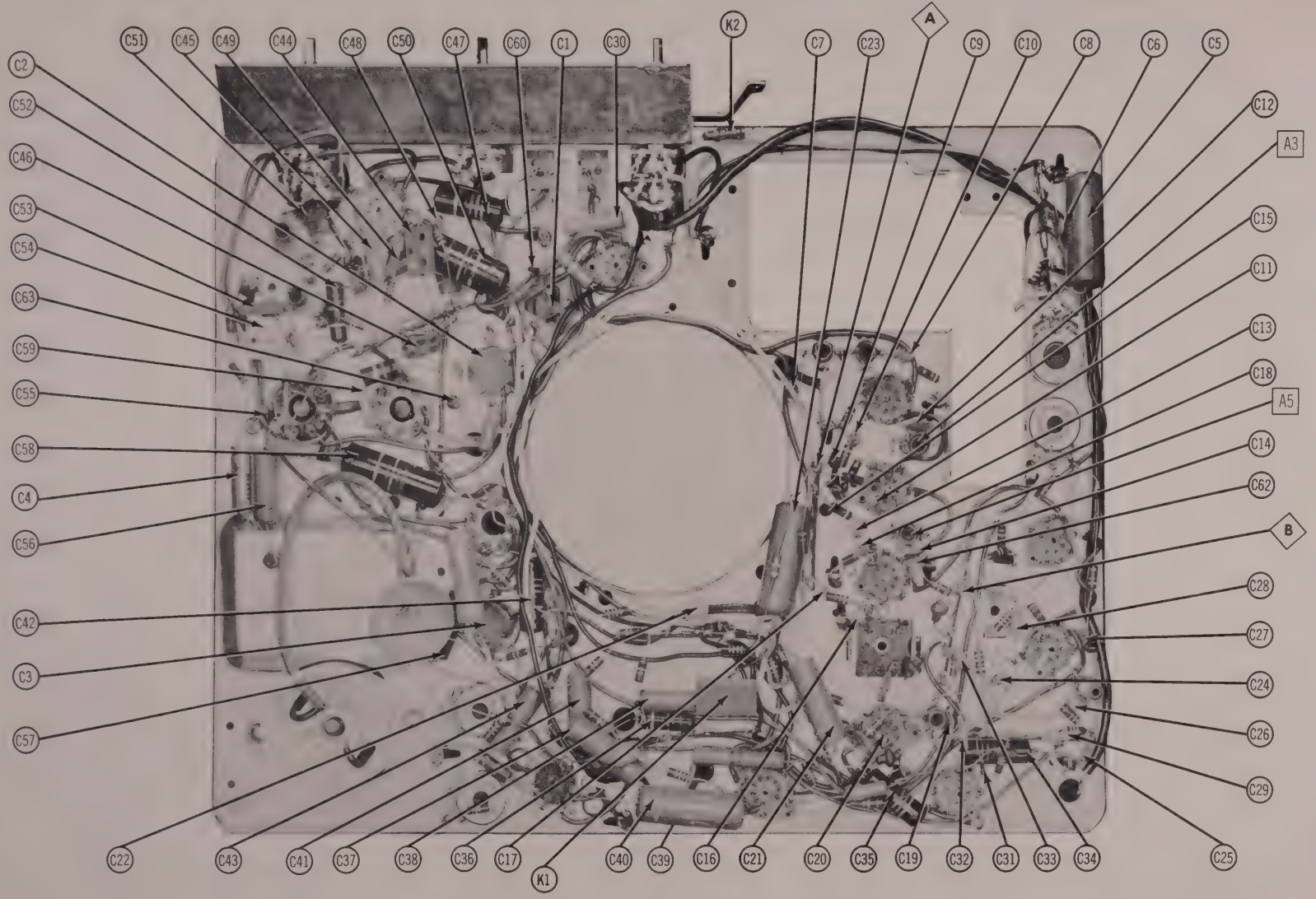
VHF TUNER #25A1169



RF TUNER



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TRUETONE
MODEL 2DC3840A

FOLDER 3

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	3BZ6	
V2	2nd Video IF Amp	3BZ6	
V3	3rd Video IF Amp	3CB6	
V4	Video Output-2nd Sync Amp	6CX8	
V5	Agc, Keying-Vert Osc	5AN8	
V6	Audio Det	3BN6	
V7	Audio Output	5AQ5	

ITEM No	USE	TYPE	NOTES
V8	1st Sync Amp	3AU6	
V9	Sync Sep.	3BT6	
V10	Vert. Output	5CS5	
V11	Horiz. AFC-Horiz. Osc.	6CG7	
V12	Horiz. Output	13DQ6	
V13	Damper	13DAGT	
V14	HV Rectifier	1G3GT	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	PART No.	GENERAL ELECTRIC PART No	RCA PART No	SYLVANIA PART No	
V15	17BZP4		17BZP4 ①	17BZP4 ②	① "Silverama" ® ② Silver Screen 85

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP	VOLT	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	140	150	45X421	AFS81-33	XA038I	FP1JT	TMS-34	T-055	TVL-1436
C2A	⌐125	300	45X431	AFH4-03-60	XC0733.2	FP2I8 ┐		Q-222.2 ┐	R2S75 *
B	⌐20	300				TT50X30 ┘		MT-0530 ┘	
C	⌐20	50	1						
C3A	⌐125	300	45X420	AFH3-99-83	XC0733.7	FP330.27	TMT-36	T-115 ┐	TVL-3574.6
B	⌐60	300						MT-0560 ┘	
C	⌐40	50	┘						
C4	4	50		PRS150V4	BBR4-50	TT50X5	TD-4-50	MT-0504	TE-1302.1

① In some versions C3C and C3C may be interchanged, or C3C may be omitted.
② Some versions may use a 5mfd ® 50VDC in this application (Part #45X418).
* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP	VOLT	TRUETONE PART No	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	SPRAGUE PART No.	
C5	47	200	RCP10M2474M	P288N-47		CUB2P47	GEM-2047	2TM-P47	
C6	470		80X4	BPD-00047	DD-47I	LI0T47	UC-5347	5GA-T47	
C7	47		47X503	NPO-S1 47	D6-470			5TCC-Q47	10%
C8	100		47X504	SI 100	D6-101	LI0T1	UC-531	5GA-T1	
C9	1000		80X1	BPD-001	DD-102	BYA6DI	DC521	5HK-DI	
C10	680		80X3	BPD-00068	DD-681	LI0T68	UC-5368	5GA-T68	
C11	470		80X4	BPD-00047	DD-47I	LI0T47	UC-5347	5GA-T47	
C12	68								
C13	680		80X3	BPD-00068	DD-681	LI0T68	UC-5368	5GA-T68	NPO 5%
C14	68				DTZ-68				
C15	1000		80X1	BPD-001	DD-102	BYA6DI	DC521	5HK-DI	NPO 5%
C16	680		80X3S		MD-681				
C17	680		80X3	BPD-00068	DD-681	LI0T68	UC-5368	5GA-T68	10%
C18	470		80X4	BPD-00047	DD-47I	LI0T47	UC-5347	5GA-T47	
C19	30		48X3S89						
C20	100		47X504	SI 100	D6-101	LI0T1	UC-531	5GA-T1	N33 10%
C21	1	400	RCP10M4104M	P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C22	1000	1400	47XT53	HVZ1S-1000	DD80-102	HVB1S2I	DC302I	30GA-DI	
C23	.47	200	RCP10M3474M	P288N-47	DF-503	CUB3P47	GEM-3047	3TM-P47	
C24	3.3		47X389	NPO-S1 3.3	TCZ-3R3	CTA4V33C	ZT-5S33	5TCCB-V33	
C25	1000		80X3S						10%
C26	15		47XT72						N330 10%
C27A	1000 ⌐		80X3	BPD-2X001	DD8-103	BYD6DDI	DCD52I	5HK-3DI	
B	1000 ⌐								
C28	5000		47X507	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C29	5000		47X507	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C30	.0047	400	RCP10M4473M	P488N-0047	DE-472	CUB4D47	GEM-4347	4TM-D47	
C31	1000		80X1	BPD-001	DD-102	BYA6DI	DC521	5HK-DI	
C32	5000		47X507	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C33	150			BPD-0001S	DD-151	LI0T15	UC-5315	5GA-T15	①
C34	.047	400	RCP10M4473M	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C35	.047	400	RCP10M4473M	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C36	.01	400	RCP10M4103K	P488N-01	DE-103	CUB4S1	GEM-411	4TM-S1	
C37	.047	600	RCP10M6473M	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C38	.047	200	RCP10M2473K	P288N-047	DF-503	CUB2S47	GEM-2147	2TM-S47	
C39	.01	400	RCP10M4473K	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C40	.1	600	RCP10M6104M	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C41	.047	400	RCP10M4473K	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C42	.047	400	RCP10M4473K	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C43	.047	200	RCP10M2473M	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C44	18		RCM20B180K	1469-000018	DD-180	22R5Q18	MS-418	MS-418	10%
C45	82		RCM20B820K	1469-000082	DD-820	22R5Q82	MS-482	MS-482	10%
C46	100		RCM20B101K	1469-0001	DD-101	22R5T1	MCB235	MS-31	10%
C47	.047	400	RCP10M4473M	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C48	.047	200	RCP10M2473M	P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C49	.022	200	RCP10M2223M	P288N-022	DF-503	CUB4S22	GEM-4123	2TM-S22	
C50	.47	200	RCP10M2474M	P288N-47		CUB2P47	GEM-3047	2TM-P47	
C51	220		RCM20B220K	1469-00022	MD-221	22R5T22		MS-322	10%
C52	.01	600	RCP10M6103M	P688N-01	DE-103	CUB6S1	GEM-611	6TM-S1	
C53	330		RCM20B331K	1469-00033		1R5T22		MS-331	10%
C54	170 ⌐		17AZ2						
	700 ⌐								
C55	1000		80X1	BPD-001	DD-102	BYA6DI	DC521	5HK-DI	
C56	.047	400	RCP10M4473M	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C57	.047	400	RCP10M4473M	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C58	.1	600	RCP10M6104M	P688N-1	DF-104	CUB6P1	GEM-601	6TM-P1	
C59	150	5000	47XT58						N1500 10%
C60	1000		80X1	BPD-001	DD-102	BYA6DI	DC521	5HK-DI	
C61	22	400	RCP10M4224M	P488N-22		CUB4P22	GEM-4022	4TM-P22	
C62A	1000 ⌐		80X3	BPD-2X001	DD2-102	BYD6DDI	DCD52I	5HK-3DI	
B	1000 ⌐								
C63	1000		80X1	BPD-001	DD-102	BYA6DI	DC521	5HK-DI	②

① Some versions may use 330mmf in this application as part of a component combination.
② Not used in some versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500Ω	½	78X34				U5123S	Contrast
B	2meg						Not Req.	Volume
C	Switch						Not Req.	Push-Push
R2A	500K	½	40X435	AB-59	A47-500K-2	Q11-133	U50	Brightness
B	Shaft			AK-19	R8-3/18	NQ	DS-37	
R3A	50K	½	78X38	F1-29			■ U52856	Horiz. Hold
B	2meg			R3-67			PTA54L	Vert. Hold
R4A	50K	½	40X436	AB-31	B47-500K-6	Q11-133		Vert. Lin.
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R5A	2.5meg	½	40X198	AB-83	B47-2.5meg-6	Q11-239	SU-565	Height
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R6A	2.5meg	½	40X198	AB-83	B47-2.5meg-6	Q11-239	SU-566	Sync Stab
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R7A	1.5meg	½	40X437	AB-742	B47-1.5meg-6	Q11-138	PTA1254L	Range
B	Shaft			AK-19	Not Req.	TQ	Not Req.	
R8	500Ω	1(WW)	40X397		39-500		FL-600	Buzz

■ "STA-LOC" Equivalent : FA54L, OF1000, RU36L, SI1625.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R9	390K		B84324	
R10	680K		B84684	
R11	4700Ω		B84472	
R12	470Ω		B85471	
R13	47Ω 5%		B83470	
R14	68K		B84683	
R15	1000Ω		B85102	
R16	470Ω		B85471	
R17	470Ω		B85471	
R18	47Ω 5%		B83470	
R19	22K		B84223	
R20	470Ω		B85471	
R21	180Ω		B84181	
R22	3900Ω 5%		B83392	
R23	5000Ω	4	43X358	
R24	47Ω		B84470	
R25	180K		B84184	
R26	2.2meg		B84225	
R27	100K		B85104	
R28	270K		B84274	
R29	33K		B84333	
R30	100K		B84104	
R31	330K		B84334	
R32	100K		B84104	
R33	470K		B84474	
R34	47K		B84473	
R35	47K		B84473	
R36	100Ω		B84101	Note 1
R37	680Ω		B84681	
R38	330K		B84334	
R39	4700Ω		B84472	
R40	470Ω	1	C85471	
R41	330Ω	1	C84331	
R42	10K		B84103	
R43	10K		B84103	
R44	6800Ω		B84682	
R45	270K		B84274	
R46	47K		B84473	
R47	330K		B84334	

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R48	2.2meg		B84225	
R49	270K			Note 2
R50	27K	1	C84273	
R51	47K		B84473	
R52	4700Ω		B84472	
R53	47K		B84473	
R54	630K		B84634	
R55	390K		B84394	
R56	270K		B84274	Note 3
R57	10K 5%		B83103	
R58	10K 5%		B83103	
R59	10K 5%		B83103	
R60	18K		B84183	Note 4
R61	470Ω	1	C84471	
R62	22K		B84223	
R63	220Ω			
R64	3.5kCold			
R65	220Ω			
R66	220K		B84224	
R67	330K		B84334	
R68	620K		B84624	
R69	180K		B84184	
R70	82K		B84823	
R71	330K		B84334	
R72	3900Ω		B84392	
R73	82K		B84823	
R74	22K		B84223	
R75	10K		B85103	
R76	56K		B84563	
R77	1meg		B84105	
R78	1meg		B84105	
R79	68Ω		B85680	
R80	10K	2	D84103	
R81	100Ω	2	D84101	
R82	4700Ω		B84472	
R83	1700Ω	10	43X294	
R84	7Ω	15	43X303	
R85	52Ω	20	43X302	

Note 1. Not used in some versions.
Note 2. Some versions may use 150K in this as part of a component combination.
Note 3. Some versions may use 470K in this application.
Note 4. Some versions may use 15K in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		TRUETONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No	
L1	Ant. Trans.	9A2417					
L2	39MC Coil	9A2365		TV-152	4206		
L3	Ist. Video IF	9A2365	17-4534	TV-181		VF-4	
L4A	47.25MC Trap	9A2363	17-4536		6222		
B	2nd. Video IF						
L5A	41.25MC Trap	9A2414	17-4535		6221		
B	3rd. Video IF						
L6A	4th. Video IF	9A2370	17-4514 *				Includes M3, and Caps.
B	Resonant Choke						
L7	Resonant Choke	9A2375					
L8	Shunt Peaking Coil	38A12	19-3160	TV-196	6120	VP-5	160 Microhenries
L9	Shunt Peaking Coil	38A36	19-3100	TV-194	6112	VP-3	100 Microhenries
L10	4.5MC Trap	9A2366	20-1004	TV-151	1469 †	SF-3	
L11	Series Peaking Coil	38A43	19-3180	TV-196	6120		150 Microhenries
L12	Shunt Peaking Coil	36A2	19-4201	TV-184	6180	VP-5	190 Microhenries
L13	Sound IF	9A2400		TV-154			
L14	Quadrature Coil	9A2367	20-1005	TV-121	1480		
L15	RF Choke	9A2380		SW-831	4609		5 Microhenries

* Enlarge mounting holes.
† Disregard tap.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA					NOTES
	PRI.	SEC.	TRUETONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L16	77Ω *		9A2416		TV-165	6212		HF-7	Horiz. Freq. * Tapped @ 54Ω Horiz. Waveform
L17	52Ω		9A2372						

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA							
	CURRENT (Measured)	DC RES	INDUCTANCE @ CURRENT 1000 ~(L)	TRUETONE PART No.	Halldorson PART No.	Merit PART No	Ram PART No	Stancor PART No.	Thordarson PART No	Triad PART No	NOTES
L18	.320A	40Ω	1 Hy.	53X95-7					28C44 ①		

① Drill new mounting hole.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							NOTES
		TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	Vert. Osc.	54X19	B8702	A-3003	V405	A-8125	28A03	A-97X	
T2	Vert. Output	51X181					28S14	A-113X ②	
T3 A	Yoke-Horiz. (19MH)	9A3416			Y-110 ①②	DY-37A ①	Y-52 ①	Y-60 &	
B	(10?)-Vert. (13Mh)							NW23	
	Rear Cover & Centering Device	2A486							
	Yoke Clamp	30X628							
T4	Horiz. Output	53X366							

① Use original rear cover and centering device, horizontal damping network.
② Connect yoke terminal #2 to yoke plug pin #4, yoke terminal #1 and #3 to yoke plug pin #3, yoke terminal #1 to yoke plug pin #2.
③ Connect as autoformer

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	6100Ω	3-4Ω	51X185	Z1110	A-3026	AU-602 ①	A-3677 ①	24S51 ①	S-6X	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No	
SP1	4"	PM	3-4Ω	12A541	4A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No	REPLACEMENT DATA	
K1	Vert. Integrator	3000mmf, 5000mmf, 5000mmf, 8200Ω, 8200Ω, 22k	76X7	Aerovox	PA-110
				Centralab	PC-104
				Cornell-Dubilier	115TM1
				Sprague	V-1/V-3
K2	Chassis Isolation	470mmf 1500V , 3-lmeg	76X11	Centralab	RC-4TI
				Sprague	AC1-1

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT (Measured)	TRUETONE PART No	FEDERAL PART No	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No	SARKES TARZIAN PART No.		
M1	.320A	68X19 ①		1N1007 ②	SD-94 ①	40K ①	① Silicon Type.	
M2	.320A	68X19 ①		1N1007 ②	SD-94 ①	40K ①	② Germanium Type.	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		TRUETONE PART No.	CBS PART No.	SYLVANIA PART No.	
M3	1N60 *		1N60	1N295	Video Detector (Pigtail) * Some versions may use a CK706A in this application

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Tuner	25A1169	VHF (Standard Coil Part #FNS-053)
M5	Circuit Breaker	2A475	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

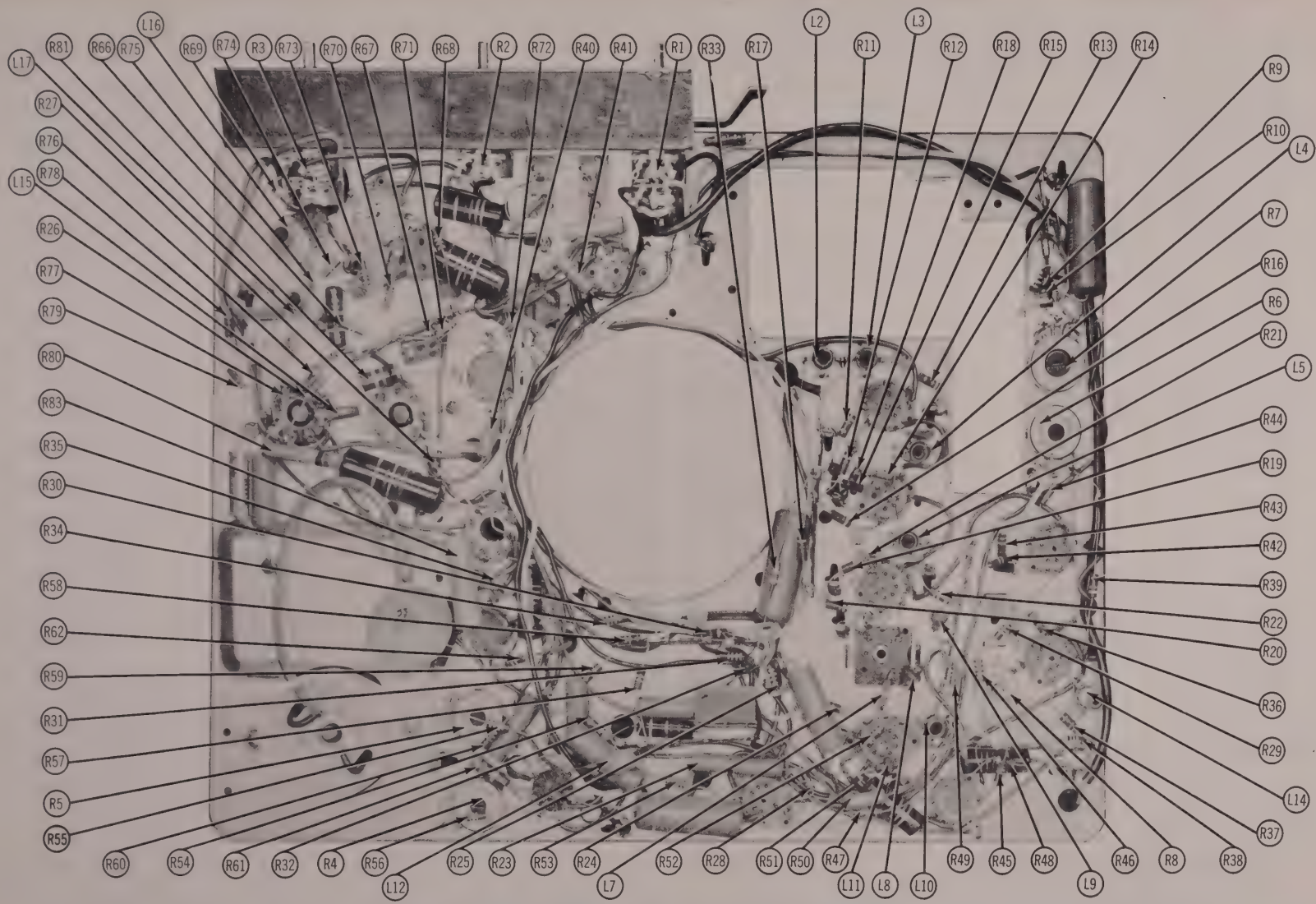
NAME	PART NO.	DESCRIPTION
Safety Glass	17X197	
Mask	4X1349-2	
Knob	10A923-1	Channel Selector
Knob	10A924-1	Fine Tuning
Knob	10A921-4	Volume
Knob	10A922-1	Contrast
Knob	10A922-2	Brightness
Cabinet	26A568	Top
Cabinet	26A567	Bottom

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 9738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TRUETONE MODEL 2DC3840A

FOLDER 3



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amp.	2BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	5CG8	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120		13L8DB121K	BPD-00012	DD-121	L10T12	UC-5312	5GA-T12	
C202	30		13M320EA300NH-Z3						
C203	15		13L8GP150K	N750-DI 15	DTN-15	C10Q15U		5TCU-Q15	N750 10%
C204	15		13L8GP150J	BPD-000015	DD-150	L10Q15	UC-5415	5GA-Q15	
C205	800		13M320EA801Z-Z3						
C206	2-8		31B-206-07						
C207	47		13M130U470J-01						
C208	2-6		31B-206-01						
C209	800		13M320EA801Z-Z3						
C210	1.0		13D-111-35	NPO-SI 1.0	TCZ-1			5TCCB-V1	①
C211	51		13L10T510K						N470 10%
C212	2-6		31B-206-01						
C213	1000		31J-024	BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C214	10		13L8U100D						N470
C215	10		13LUA100D						N1400
C216	1.5			NPO-SI 1.5	TCZ-1R5	C10V15C	ZT-5515	5TCCB-V15	NPO ②
C217									
C218	30		13M320EA300NH-Z3						
C219	1000			BPD-001	DD-102	BYA6D1	DC521	5HK-D1	
C220	800		13M320EA801Z-Z3						

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R201	4700Ω		12TAE472M	
R202	1000Ω		12TAE102M	
R203	10K		12TAE103M	
R204	220K		12TAE224M	

ITEM No.	RATING		PART No.	NOTES
	OHMS	WATT		
R205	10K		12TAE103M	
R206	1000Ω		12TAE102M	
R207	10K		12TAE103M	
R208	5600Ω		12TAE562M	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA	
K201	Antenna Isolation	470mmf, .2-1meg	13P-198	Centralab Sprague	RC-471 R-9197
K202	Antenna Isolation	470mmf, .2-1meg	13P-198	Centralab Sprague	RC-471 R-9197

NOTE: PART NUMBERS LISTED ABOVE ARE "STANDARD COIL" PART NUMBERS.

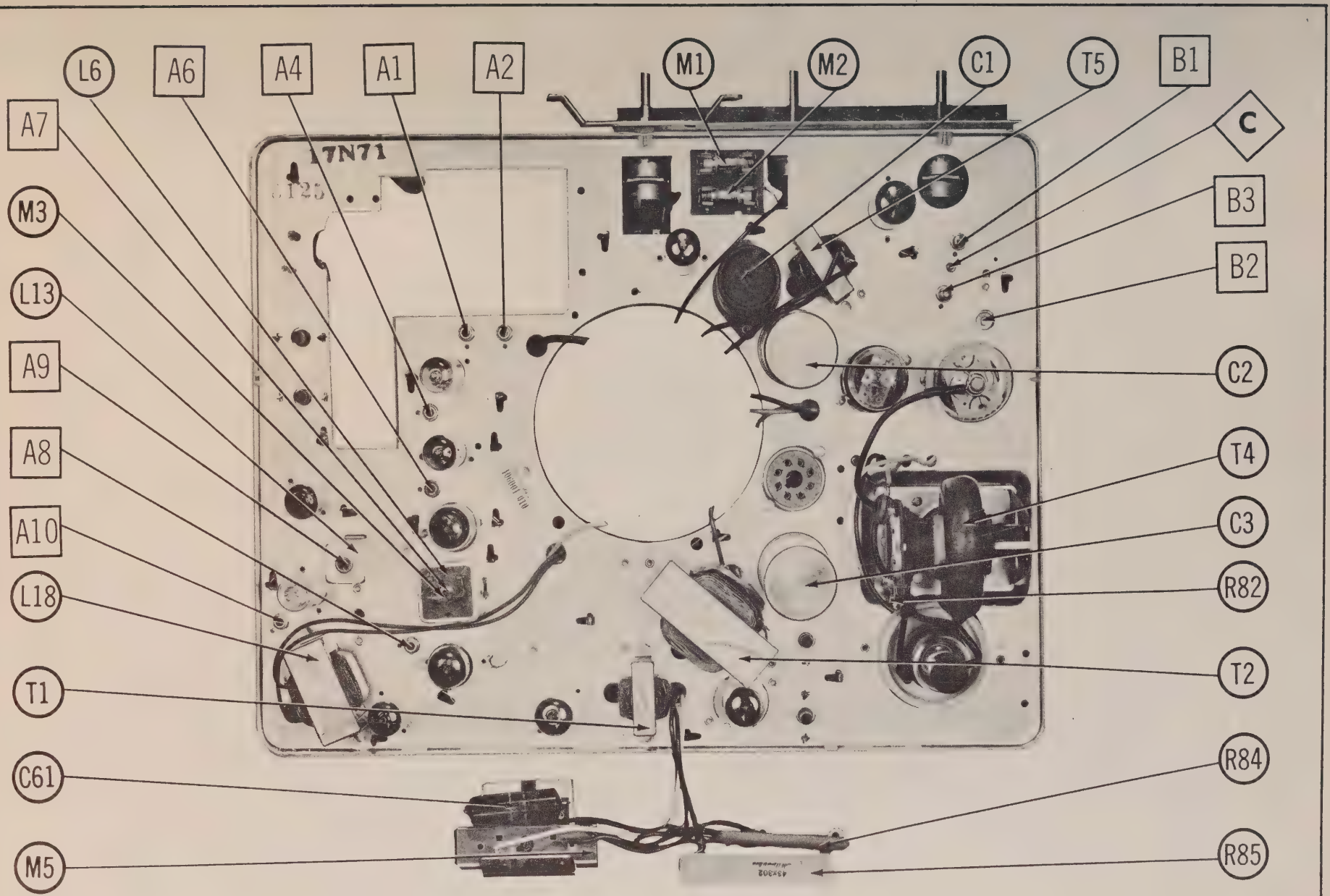
TUNER ALIGNMENT INSTRUCTIONS

OSCILLATOR ALIGNMENT

Touch-up adjustment of the VHF Oscillator is possible by removing the rear cover, and supplying power to the receiver. Set the Fine Tuning at the center of its range. The adjustments are accessible, one at a time, thru a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



CHASSIS TOP VIEW

MODEL 2DC3840A

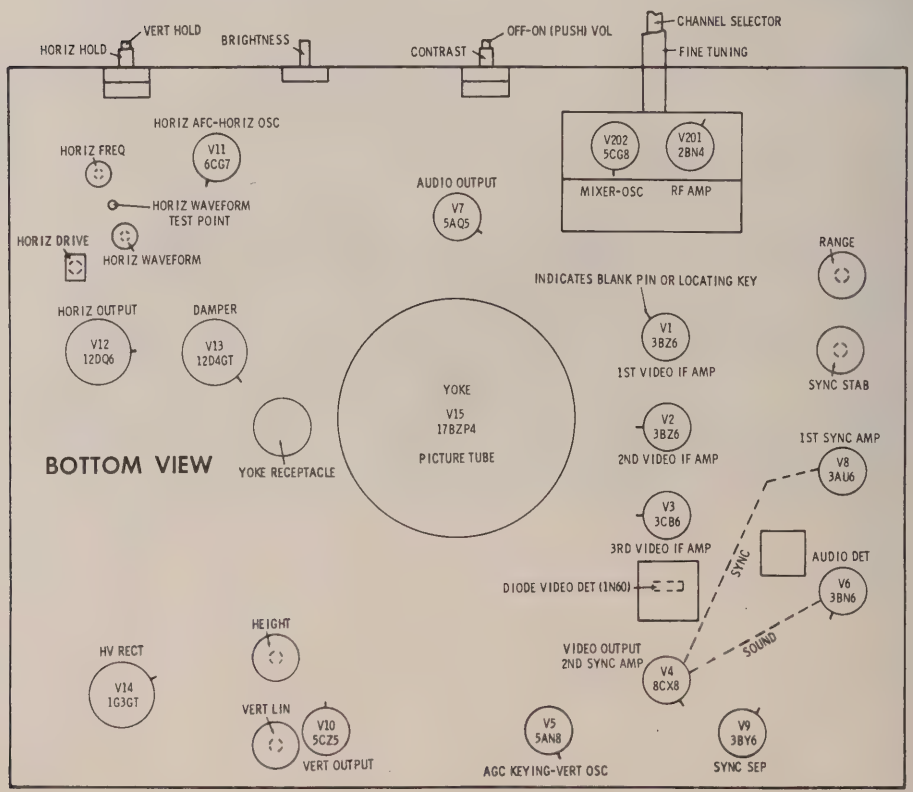
TRUETONE

FOLDER 3

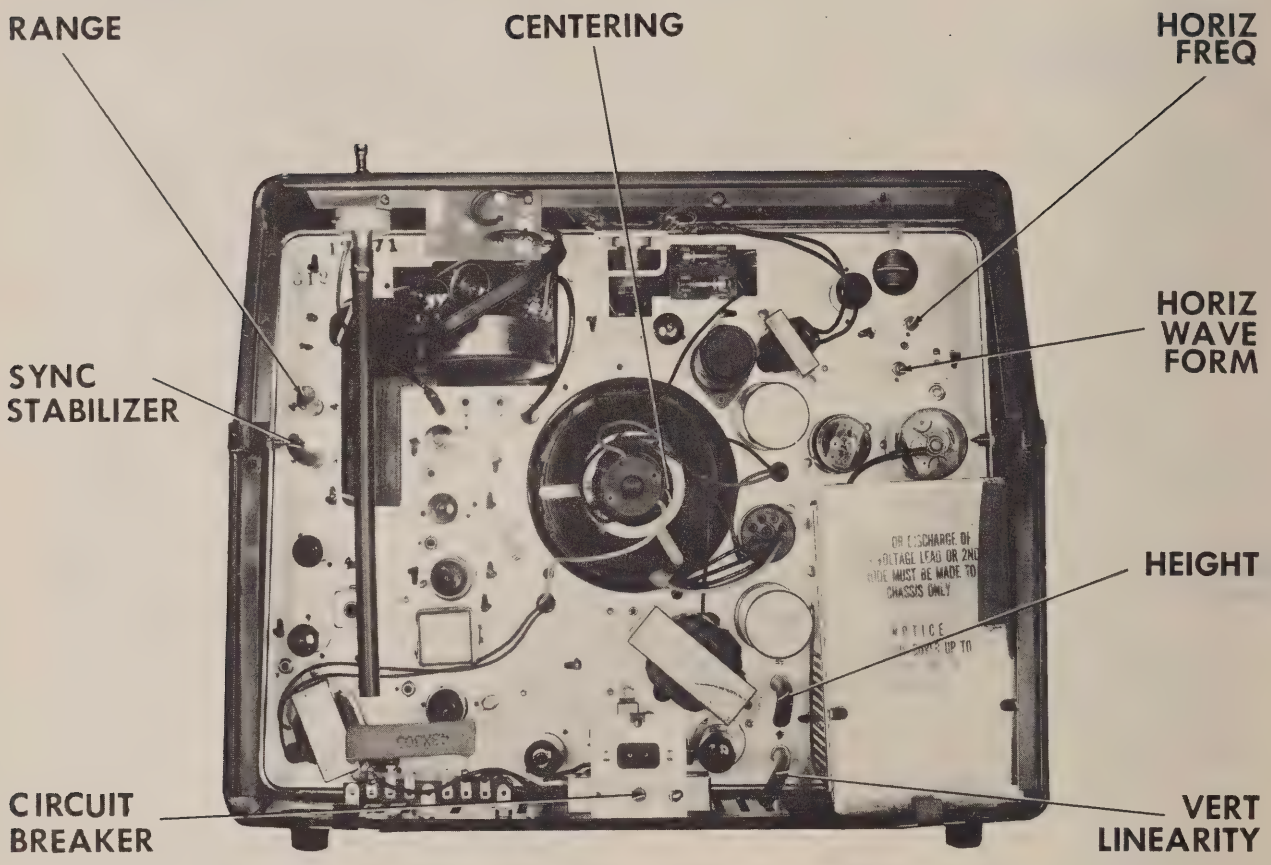
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	570K	47Ω	17Ω	16Ω	†2600Ω	†2600Ω	0Ω		
V2	3BZ6	570K	47Ω	16Ω	15Ω	†2600Ω	†2600Ω	0Ω		
V3	3CB6	.1Ω	180Ω	15Ω	14Ω	†2100Ω	†2100Ω	0Ω		
V4	8CX8	0Ω	47K	†49K	12Ω	10Ω	• 320Ω	1200Ω	†1700Ω	†5000Ω
V5	5AN8	• ǂ1.4meg	1.2meg	175Ω	18.5Ω	20Ω	300K	†0Ω	†35K	†1700Ω
V6	3BN6	• 330Ω	106Ω	13Ω	12Ω	†6400Ω	6.5Ω	†330K		
V7	5AQ5	0Ω	330Ω	17Ω	18.5Ω	†880Ω	†470Ω	0Ω		
V8	3AU6	5000Ω	†8500Ω	14Ω	13Ω	†8500Ω	†8500Ω	0Ω		
V9	3BY6	• 750K	0Ω	21.5Ω	20Ω	†820K	†29K	2.2meg		
V10	5CZ5	†0Ω	NC	270K	21.5Ω	22.5Ω	270K	470Ω	NC	†430Ω
V11	6CG7	†56K	410K	0Ω	10Ω	8.5Ω	• †30K	1.5meg	410K	0Ω
V12	12DQ6	TP	7Ω	TP	†10K	1meg	TP	4.5Ω	100Ω	TOP CAP †16Ω
V13	12D4GT	TP	NC	¶800K	NC	†.1Ω	NC	4.5Ω	2Ω	
V14	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †371Ω
V15	17BZP4	7Ω	22K	†100K	†100K	NC	NC	• 230K	8.5Ω	
V201	2BN4	0Ω	700K	0Ω	.5Ω	†2700Ω	0Ω	700K		
V202	5CG8	10K	†7300Ω	0Ω	2Ω	.5Ω	†2700Ω	†11K	0Ω	230K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 260V SOURCE. NC NO CONNECTION.
ǂ MEASURED FROM PIN 3 OF V13. TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the Horizontal Hold fully clockwise. Tune in a station and adjust the Horizontal Frequency (B1) until the picture is just about to tear out of sync (jitter at the top of the picture).

Turn the Contrast fully counterclockwise and the Brightness clockwise so that the picture appears washed out. Turn the Horizontal Drive (B2) clockwise until white vertical bars (drive lines) appears in the left center portion of the raster, then counterclockwise until the white bars just disappear.

Connect the vertical amplifier of a scope to point Ⓒ . Low side to chassis. Adjust the Horizontal Waveform (B3) until the round and sharp peaks are equal in amplitude. (See Fig. 3). Keep the picture in sync during this adjustment.

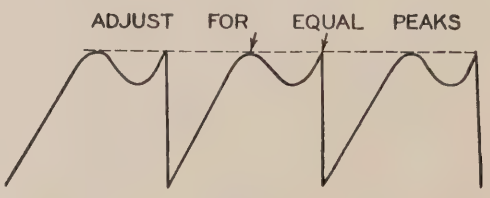


FIG. 3

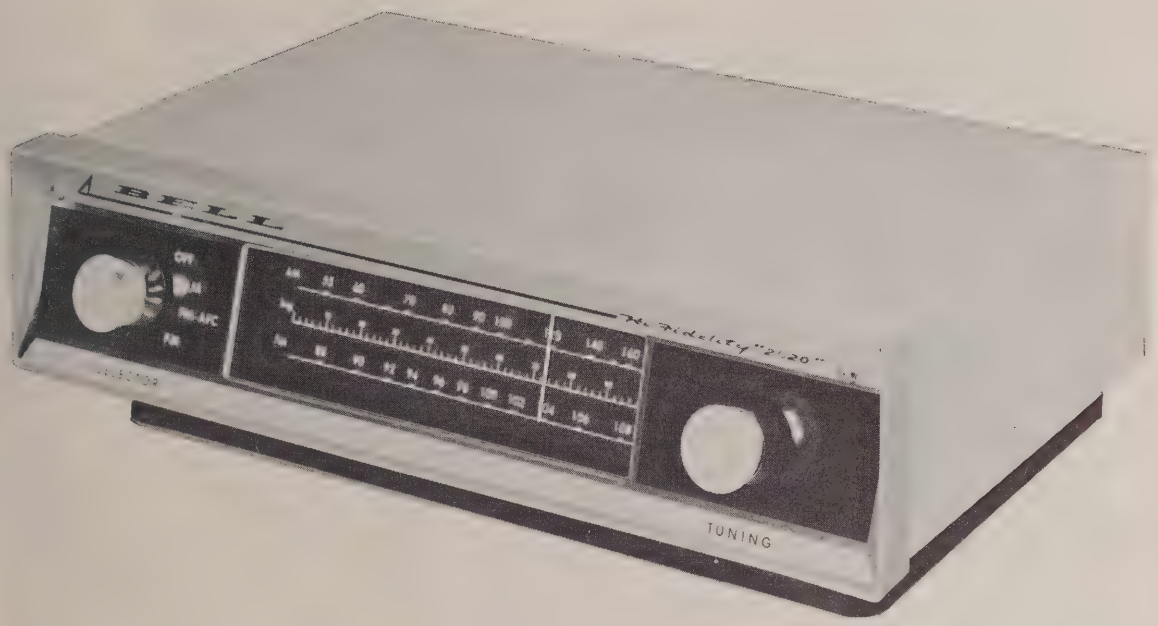
PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

BELL SOUND MODEL 2520

BELL SOUND
MODEL 2520



BELL SOUND
MODEL 2520

TRADE NAME	Bell Sound MODEL 2520	
MANUFACTURER	Bell Sound Systems Inc., 555 Marion Road, Columbus 7, Ohio	
TYPE SET	AC Operated FM-AM Tuner	
TUBES (Eight)	Types 6AB4 FM RF Amp., 12AT7 FM Conv.-FM AFC, 6BA6 1st. FM IF Amp., 6BE6 AM Converter, 6BA6 2nd. FM-1st. AM IF Amp., 6AU6 FM Limiter-AM Det.-AVC, 6AL5 Discriminator, 6X4 Rect.	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING .41 Amp. @ 117 Volts AC (40 Watts)
TUNING RANGE	540-1650KC	FREQ. MOD. 88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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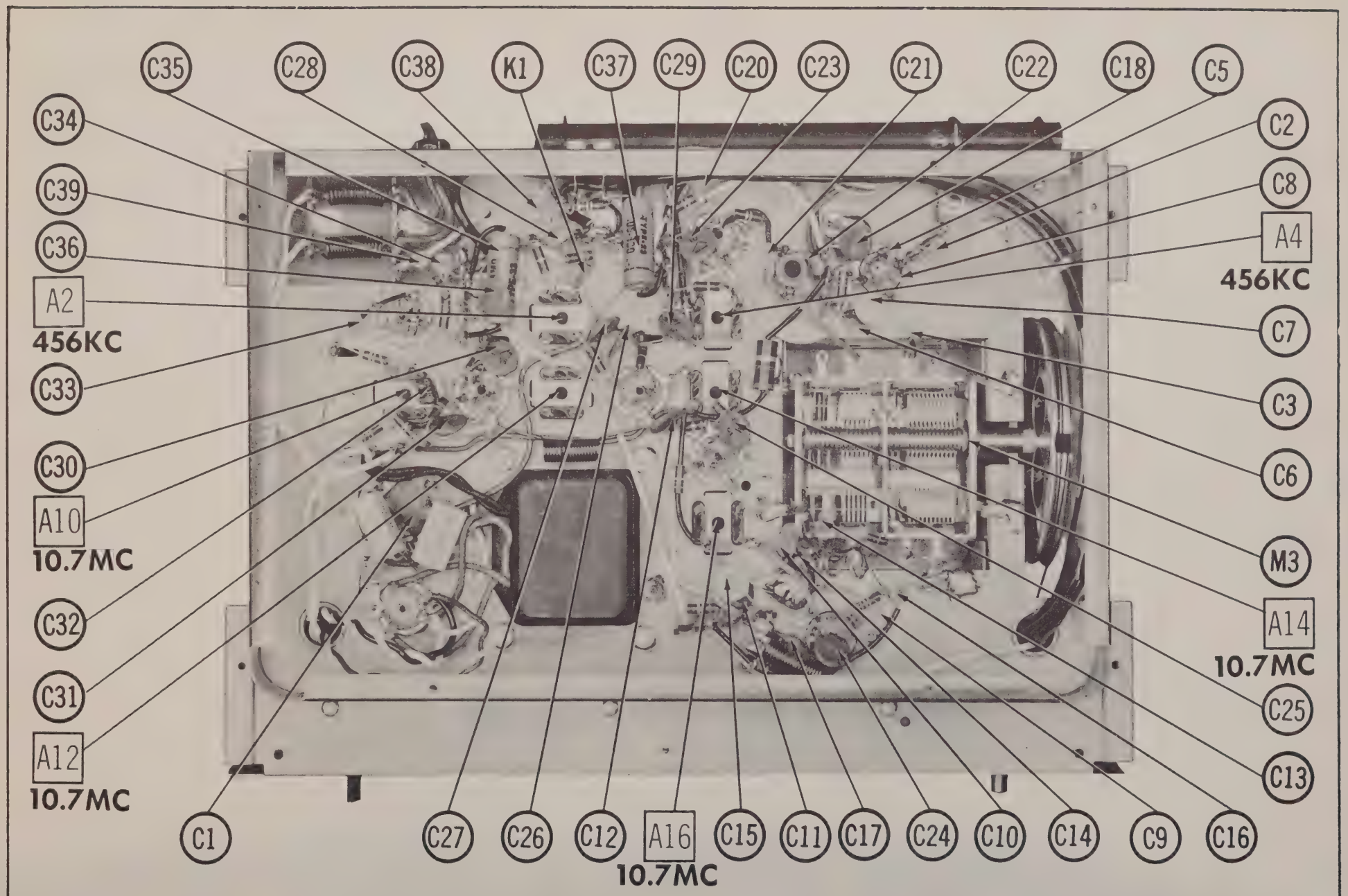
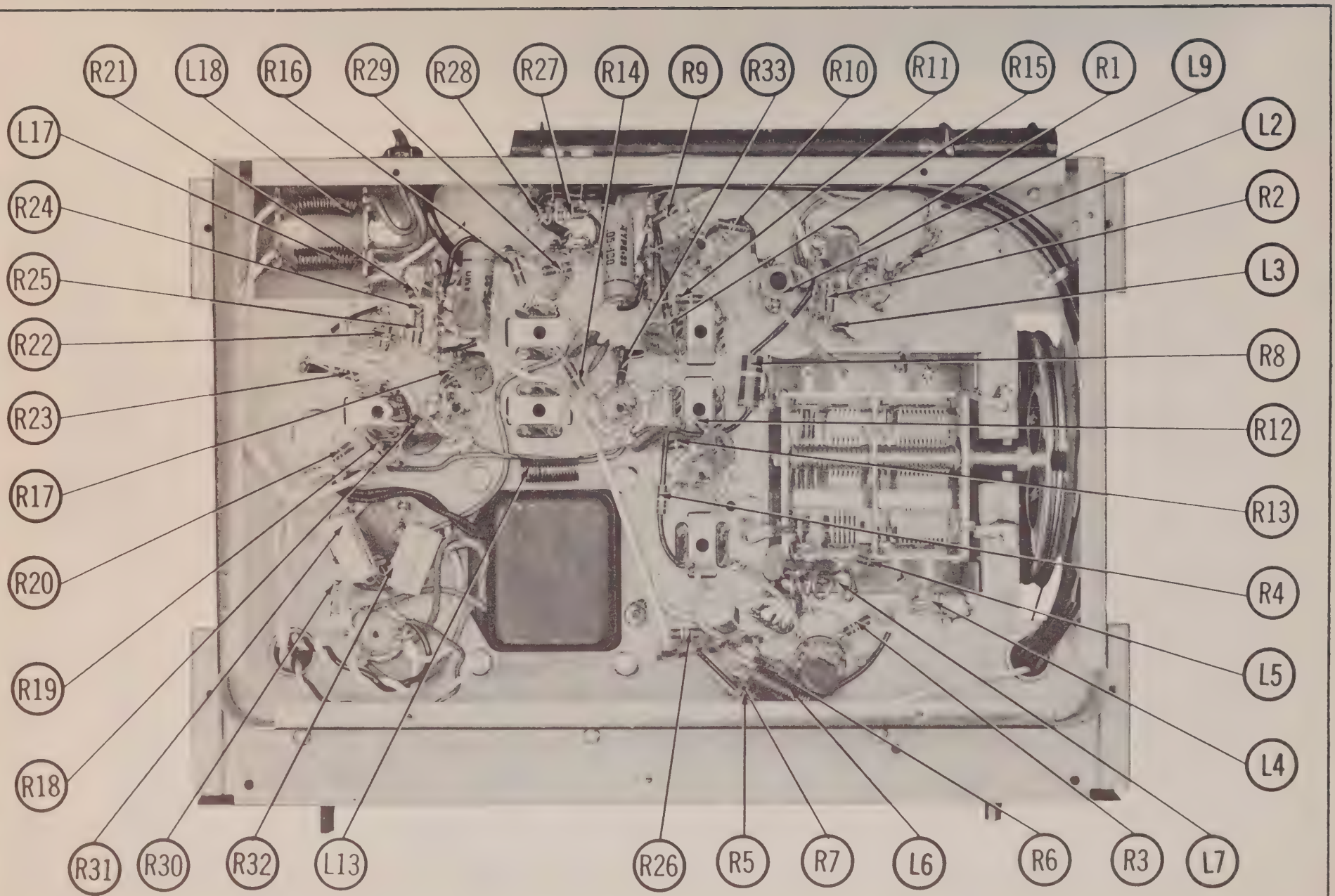
H698

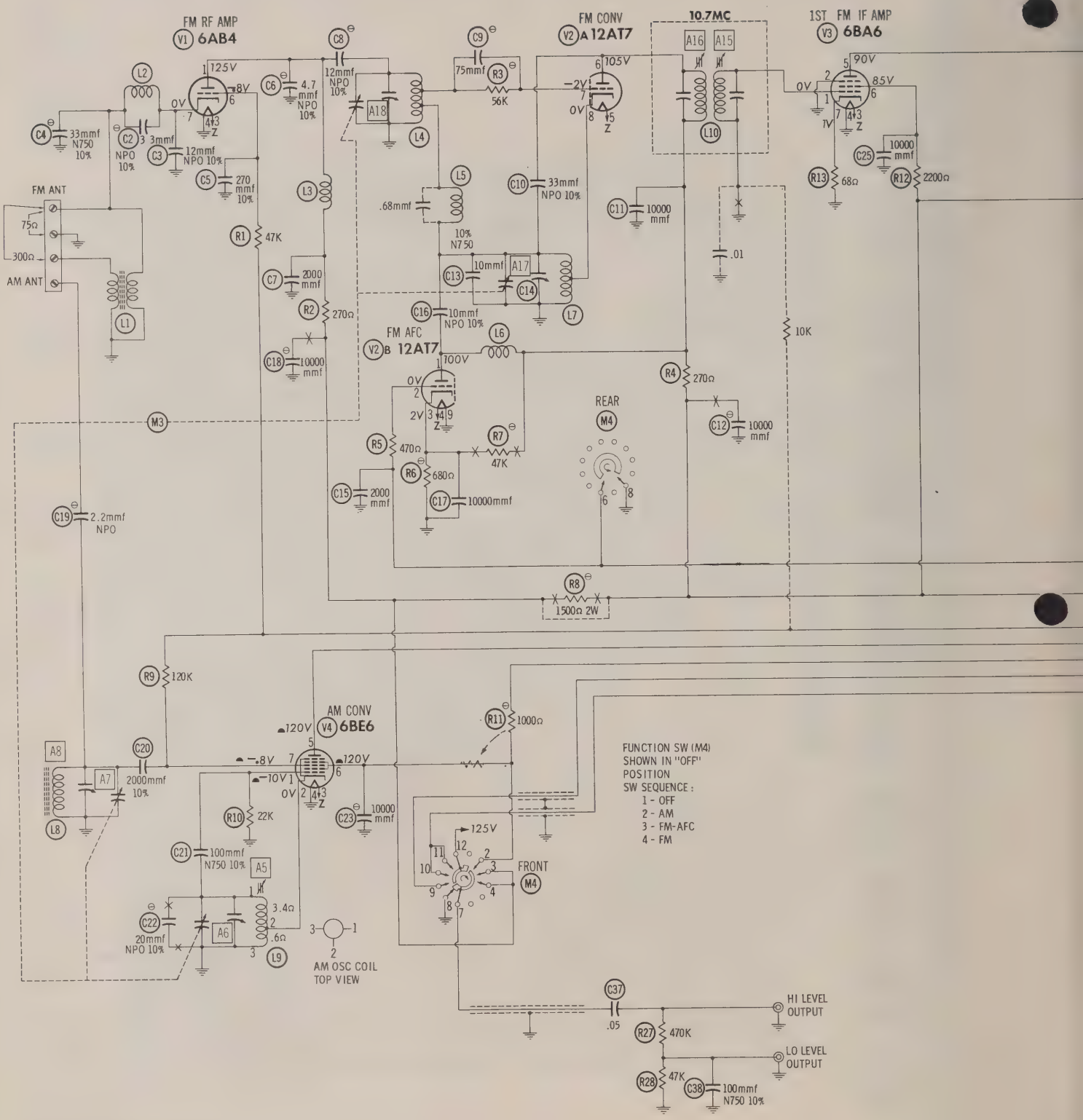
SET 421 FOLDER 4



CHASSIS BOTTOM VIEW - CAPACITOR, MISC. & ALIGN. IDENT.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

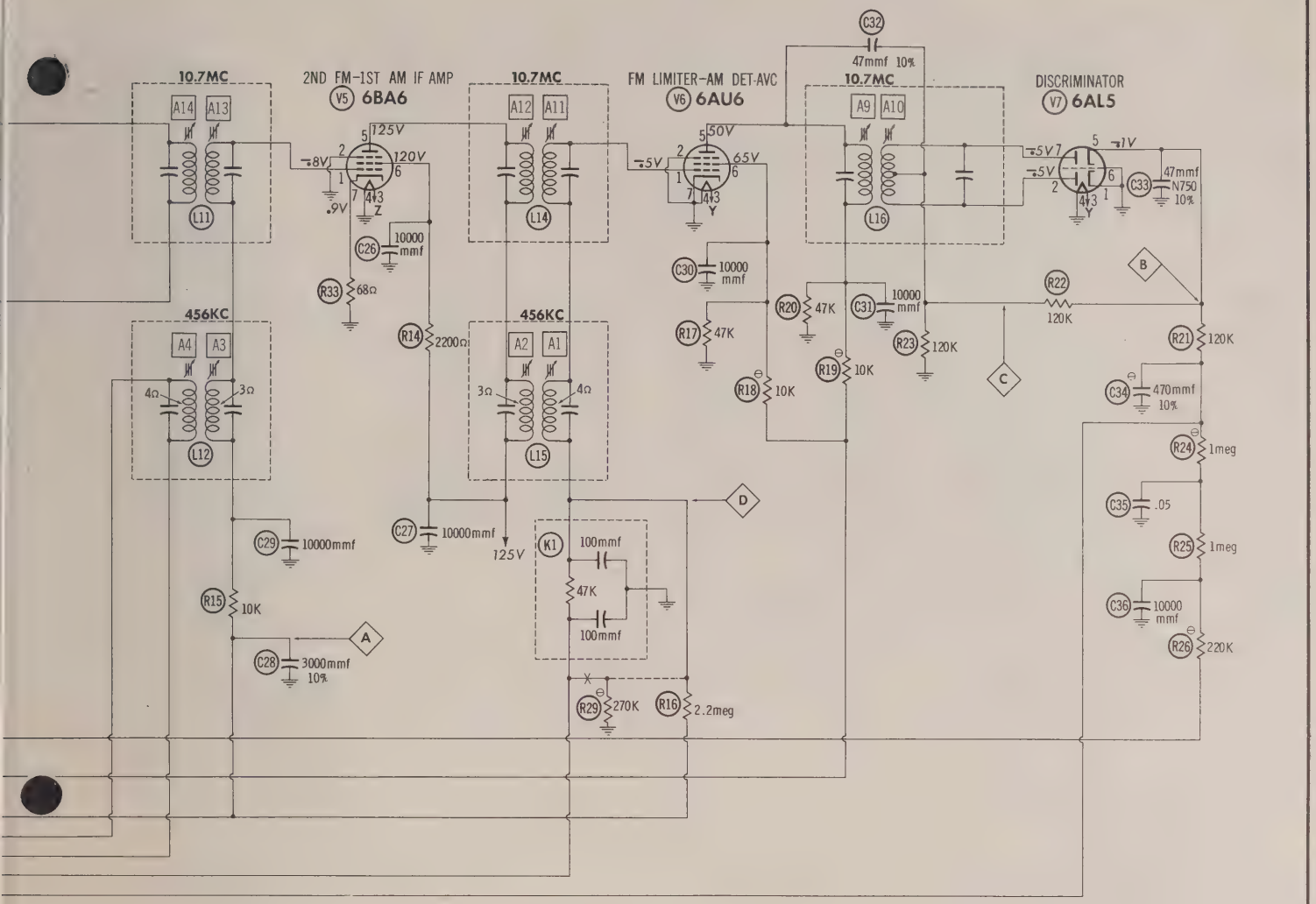


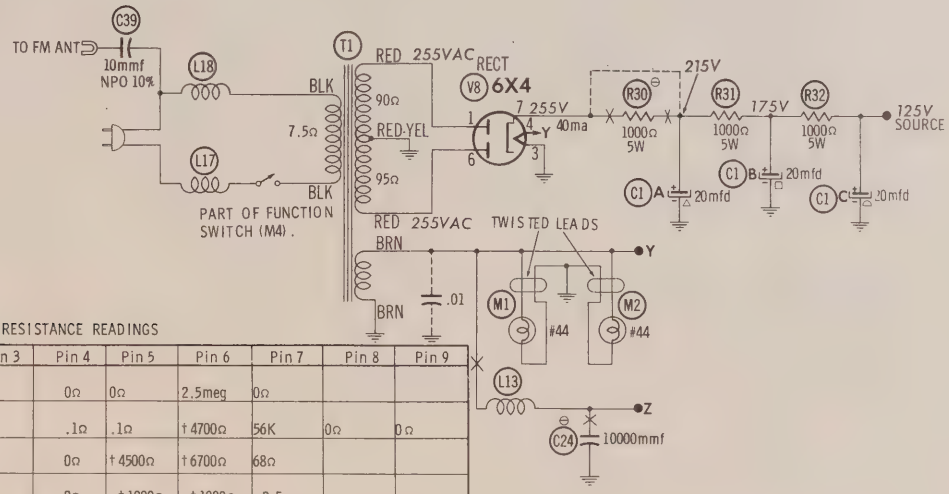
Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AB4	†3300Ω	0Ω	.1Ω	0Ω	0Ω	2.5meg	0Ω		
V2	12AT7	†4700Ω	470Ω	680Ω	.1Ω	.1Ω	†4700Ω	56K	0Ω	0Ω
V3	6BA6	.4Ω	0Ω	.1Ω	0Ω	†4500Ω	†6700Ω	68Ω		
V4	6BE6	▲.22K	▲.4Ω	.1Ω	0Ω	▲†1000Ω	▲†1000Ω	2.5meg		
V5	6BA6	2.5meg	0Ω	.1Ω	0Ω	†3000Ω	†5200Ω	68Ω		
V6	6AU6	290K	0Ω	.1Ω	0Ω	†12K	†12K	0Ω		
V7	6AL5	0Ω	120K	.1Ω	0Ω	200K	0Ω	120K		
V8	6X4	90Ω	NC	0Ω	.1Ω	NC	95Ω	¶		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

† MEASURED FROM PIN 7 OF V8.

▲ MEASURED IN "AM" POSITION.

NC NO CONNECTION.

421-4

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01mfd	High side to pin 1 (grid) of 6BA6 (V5). Low side to chassis.	456KC (Unmod)	AM	Tuning gang fully open	DC probe to point (A). Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	"	High side to pin 7 (grid) of 6BE6 (V3). Low side to chassis.	"	"	"	"	A3	Connect 50mmf from pin 5 (plate) of 6BE6 (V3) to chassis and adjust for maximum deflection.
3.	"	"	"	"	"	"	A4	Connect 50mmf from pin 1 (grid) of 6BA6 (V5) to chassis and adjust for maximum deflection.
4.	"	High side to AM antenna terminal. Low side to chassis.	600KC	"	600KC	"	A5	Adjust for maximum deflection.
5.	"	"	1400KC	"	1400KC	"	A6	"
6.	"	"	1000KC	"	Tune to 1000KC signal	"	A7	"
7.	"	"	600KC	"	Tune to 600KC signal	"	A8	Adjust for maximum deflection. Repeat steps 4 thru 7.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	.01mfd	High side to pin 1 (grid) of 6AU6 (V6). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe thru 100K to point (B). Common to chassis.	A9	Adjust for maximum deflection.
9.	"	"	"	"	"	DC probe thru 100K to point (B). Common to point (C).	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
10.	"	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	"	"	"	DC probe thru 100K to point (D). Common to chassis.	A11, A12, A13, A14, A15, A16	Adjust for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
8.	.01mfd	High side to pin 1 (grid) of 6AU6 (V6). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. thru 100K to point (B). Low side to chassis.	A9	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
9.	"	"	"	"	"	Vert. Amp. thru 100K to point (C). Low side to chassis.	A10	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.
10.	"	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	"	"	"	Vert. Amp. thru 100K to point (D). Low side to chassis.	A11, A12, A13, A14, A15, A16	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across FM antenna terminals with 120Ω on each side.	90MC (Unmod)	FM	90MC	DC probe to point (A). Common to chassis.	L7, L4	Adjust for maximum deflection by compressing or expanding coil turns.
12.	"	"	106MC	"	106MC	"	A17, A18	Adjust for maximum deflection. Repeat steps 11 and 12.

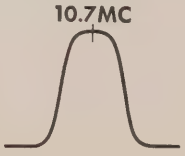


FIG. 1

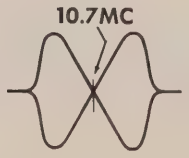


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amp.	6AB4	
V2	FM Conv.-FM AFC	12AT7	
V3	1st. FM IF Amp.	6BA6	
V4	AM Converter	6BE6	
V5	2nd. FM-1st AM IF Amp.	6BA6	
V6	FM Limiter-AM Det.-AVC	6AU6	
V7	Discriminator	6AL5	
V8	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Bell Sound PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	450		AFH3-36	C0270	FP376.5	TMT-34	T-140	TVL-3780
B	■20	450							
C	▲20	450							

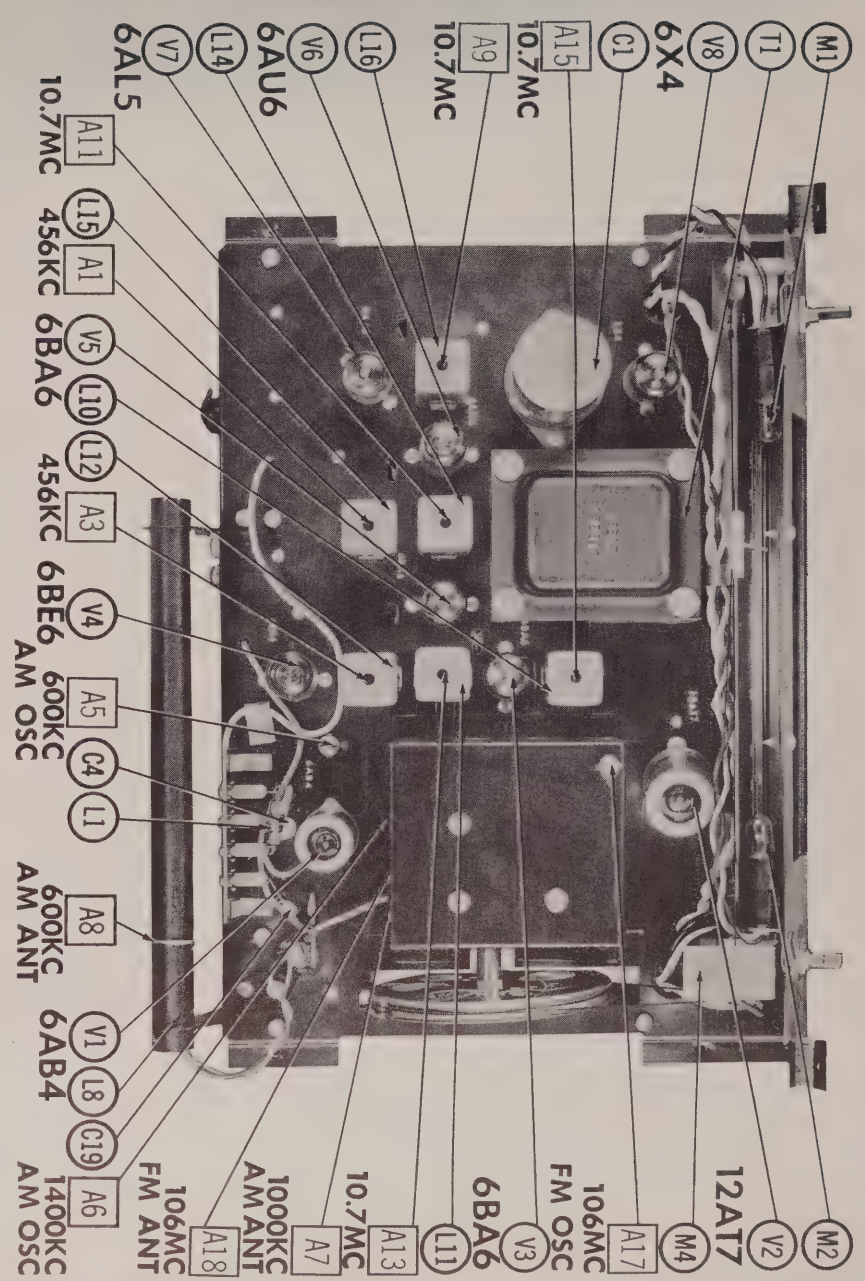
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Bell Sound PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
C2	3.3			NPO-DI 3.3	DTZ-10	C10V33C	ZT-5533	5TCCB-V33		NPO 10% ①
C3	12				TCZ-12	C10Q12C				NPO 10%
C4	33			N750-DI 33	DTN-33	C10Q33U		5TCU-Q33		N750 10% ②
C5	270				D6-271	L10T27		MS-327		10%
C6	4.7			NPO-DI 4.7	DTZ-4R7	C10V47C	ZT-5547	5TCCB-V47		NPO 10% ③
C7	2000			BPD-002	DD-202	BYA10D2	DC522	5HK-D2		
C8	12				TCZ-12	C10Q12C				NPO 10% ②
C9	75				DD-750	L10Q75	UC-5475	5GA-Q75		②
C10	33			NPO-DI33	DTZ-33	C10Q33C	ZT-5433	5TCC-Q33		NPO 10%
C11	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		
C12	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		④
C13	10			N750-DI 10	DTN-10	C10Q1U	NT-541	5TCU-Q1		N750 10%
C14										
C15	2000			BPD-002	DD-202	BYA10D2	DC522	5HK-D2		
C16	10			NPO-DI 10	DTZ-10	C10Q1C	ZT-541	5TCC-Q1		NPO 10%
C17	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		
C18	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		④
C19	2.2			NPO-SI 2.2	DTZ-2R2	C10V22C		5TCCB-V22		NPO⑤
C20	2000					1R5D2	MCB457	MS-22		10%
C21	100			N750-DI 100	DTN-100	C10T1U	NT-531	5TCU-T1		N750 10%
C22	20			NPO-DI 20	DTZ-20	C10Q2C	ZT-542	5TCC-Q2		NPO 10% ④
C23	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		
C24	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		④
C25	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		
C26	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		
C27	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		
C28	3000					1R5D3	MCB461	MS-23		10%
C29	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		
C30	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		
C31	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		
C32	47			1469-000047	D6-470	22R5Q47		MS-447		10%
C33	47			N750-DI 47	DTN-47	C10Q47U		5TCU-Q47		N750 10%
C34	470				D6-471	5R5T47		MS-347		10% ⑥
C35	.05	400		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5		
C36	10000			BPD-01	DD-103	BYA6SI	DC511	5HK-SI		
C37	.05	400		P488N-05	DF-503	CUB4S5	GEM-415	4TM-S5		
C38	100			N750-DI 100	DTN-100	C10T1U	NT-531	5TCU-T1		N750 10%
C39	10			NPO-DI 10	DTZ-10	C10Q1C	ZT-541	5TCC-Q1		NPO 10%

① Some versions may use 4.7mmf in this application.
② Some versions may use 50mmf in this application.
③ Some versions may use 3.3mmf in this application.
④ Not used in some versions.
⑤ Some versions may use 1mmf in this application.
⑥ Some versions may use 270mmf in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Bell Sound PART No.	NOTES
R1	47K			
R2	270Ω			
R3	56K			①
R4	270Ω			
R5	470Ω			
R6	680Ω			②
R7	47K			③
R8	1500Ω	2		③
R9	120K			
R10	22K			
R11	1000Ω			④
R12	2200Ω			
R13	68Ω			
R14	2200Ω			
R15	10K			
R16	2.2meg			
R17	47K			
R18	10K			⑤
R19	10K			⑥
R20	47K			
R21	120K			
R22	120K			
R23	120K			
R24	1meg			⑦
R25	1meg			
R26	220K			⑧
R27	470K			
R28	47K			
R29	270K			③
R30	1000Ω	5(WW)		③
R31	1000Ω	5(WW)		
R32	1000Ω	5(WW)		
R33	68Ω			

① Some versions may use 22K in this application.
② Some versions may use 390Ω in this application.
③ Not used in some versions.
④ Some versions may use 8200Ω in this application.
⑤ Some versions may use 47K in this application.
⑥ Some versions may use 82K in this application.
⑦ Some versions may use 2.7meg in this application.
⑧ Some versions may use 1meg in this application.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Bell Sound PART No.	REPLACEMENT DATA
K1	Diode RF Filter	100mmf, 100mmf, 47K		Aerovox PA-97-1 Centralab PC-50 Cornell-Dubilier 111TM1 Sprague D-1

MISCELLANEOUS

ITEM No.	PART NAME	Bell Sound PART No.	NOTES
M1	Lamp		#44
M2	Lamp		#44
M3	Tuning Cap.		4 Gang (AM Sections: Ant. 24-538mmf, Osc. 15-190mmf)
M4	Switch		Power On-Off, Function Rotary, wafer type

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

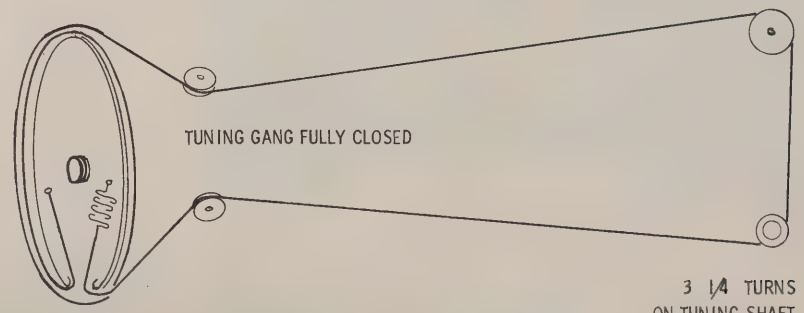
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA Bell Sound PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Coil						
L2	FM Ant. Coil		19-1007		4590		.68 Microhenry
L3	RF Choke						
L4	FM RF Coil		19-1007		4590		.68 Microhenry
L5	RF Choke						1.2 Microhenries
L6	RF Choke						
L7	FM Osc. Coil						
L8	Loop Stick						
L9	AM Osc. Coil						
L10	1st. FM IF	56-466	16-3487	FM-254	1463		
L11	2nd. FM IF	56-361	16-3487	FM-254	1463		
L12	1st. AM IF	56-364	16-6758				1.2 Microhenries
L13	Fil. Choke						
L14	3rd. FM IF	56-362	16-3487	FM-254	1463		
L15	2nd. AM IF	56-365	16-6758				
L16	Discriminator	56-363	17-3494 *	FM-253 *	1464 *		* Disconnect C32
L17	Line Choke		19-1000	BC-561	4602		1 Microhenry
L18	Line Choke		19-1000	BC-561	4602		1 Microhenry

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Bell Sound PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .385A	500VCT @ .040A	6.3V @ 3A	32B17	P9213	P-3048		PM8419	24R12	



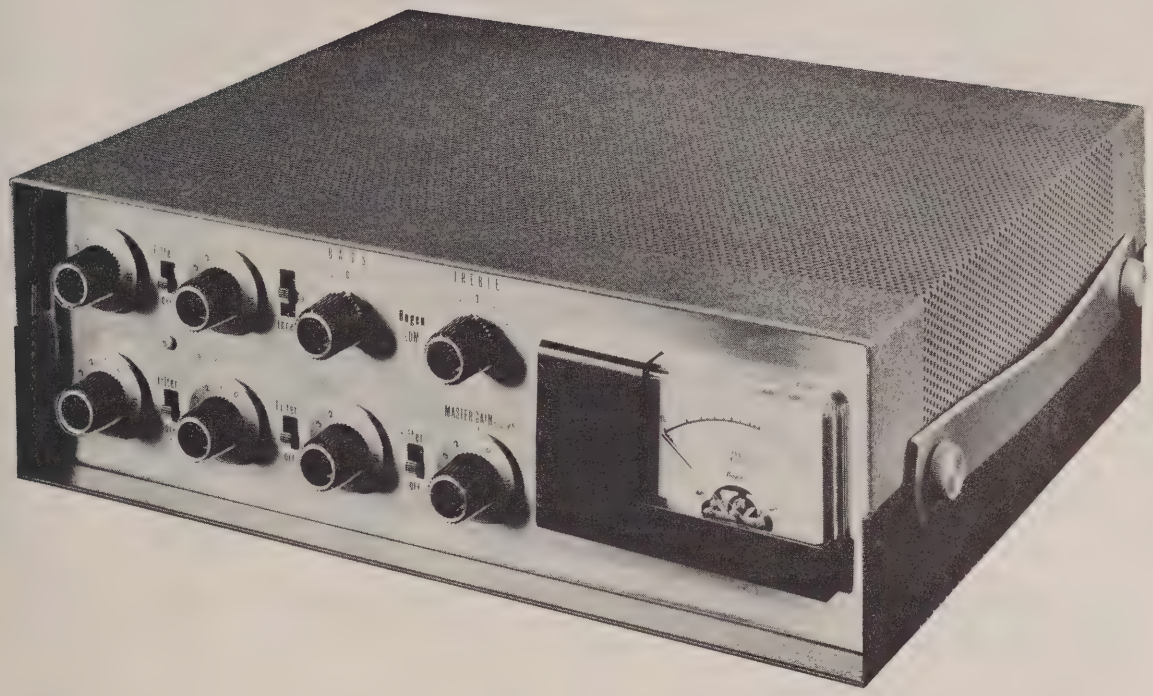
3 1/4 TURNS
ON TUNING SHAFT

DIAL CORD STRINGING

PHOTOFACT* Folder

DAVID BOGEN
MODEL LOM

DAVID BOGEN
MODEL LOM



DAVID BOGEN
MODEL LOM

TRADE NAME	David Bogen Model LOM
MANUFACTURER	David Bogen Co., P. O. Box 500, Paramus, N. J.
TYPE SET	AC Operated 5 Channel Audio Preamplifier
TUBES (Seven)	Types 12AX7 Phono-Mic 1 Preamplifier, 12AX7 Mic 2-Mic 3 Preamplifier, 12AX7 Mic 4-Mic 5 Preamplifier, 6AU6 AF Mixer, 6CG7 AF Amp.-Cath. Follower, 6BF6 Meter Amp., 6X4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .33 Amp. @ 117 Volts AC (32 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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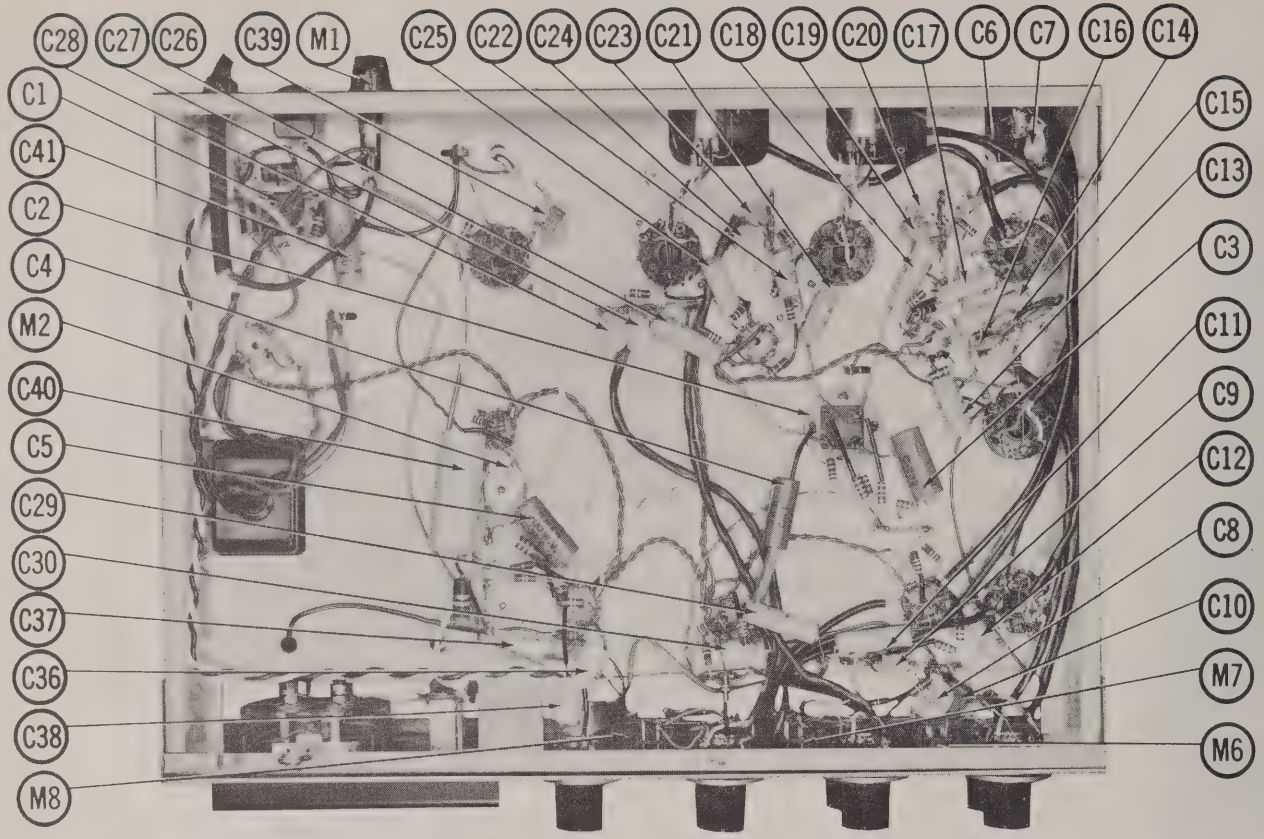
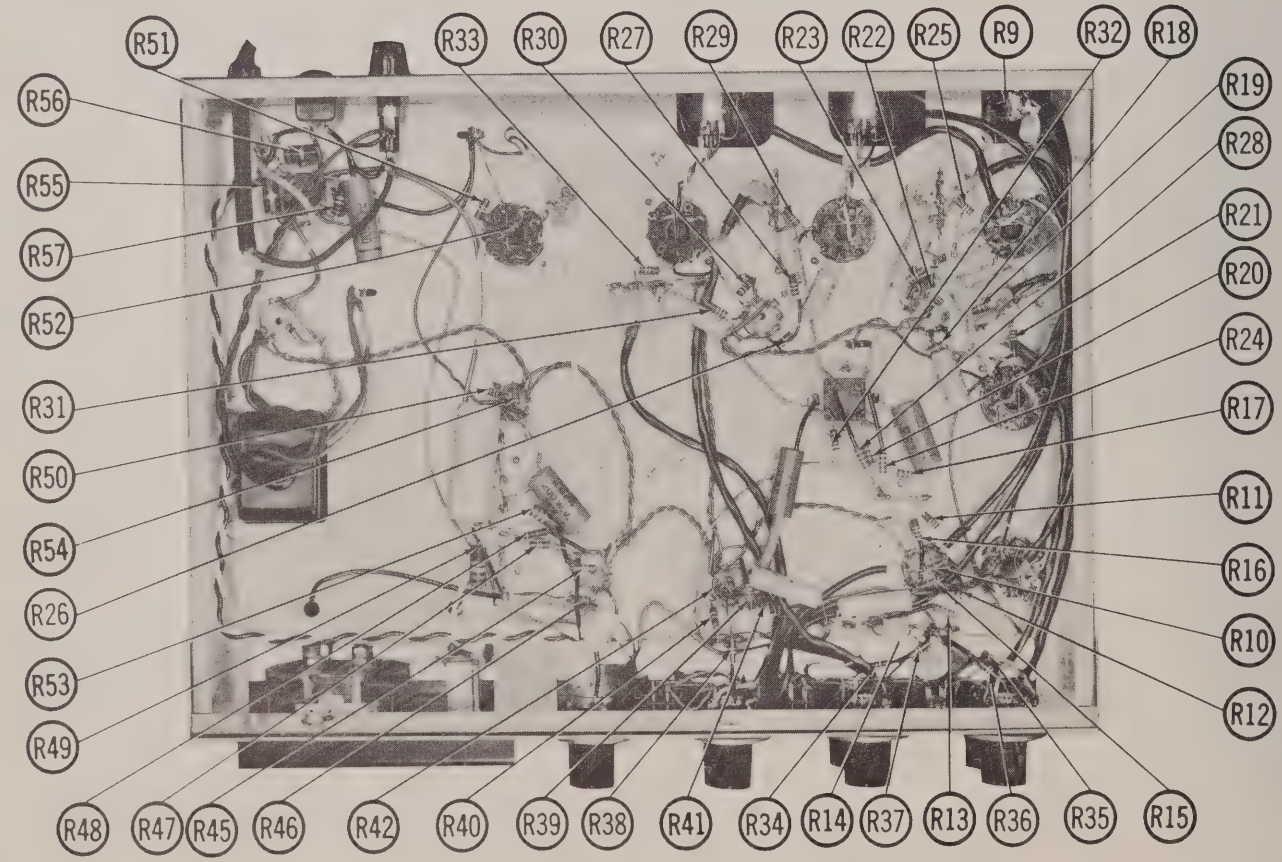
H668

SET 421 FOLDER 5



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.



CHASSIS BOTTOM VIEW - RESISTOR IDENT.

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Phono-Mic #1 Preamp.	12AX7	
V2	Mic #2 Preamplifier - Mic #3 Preamplifier	12AX7	
V3	Mic #4 Preamplifier - Mic #5 Preamplifier	12AX7	

ITEM No.	USE	TYPE	NOTES
V4	AF Mixer	6AU6	
V5	AF Amplifier - Cath. Follower	6CG7	
V6	Meter Amplifier	6BF6	
V7	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

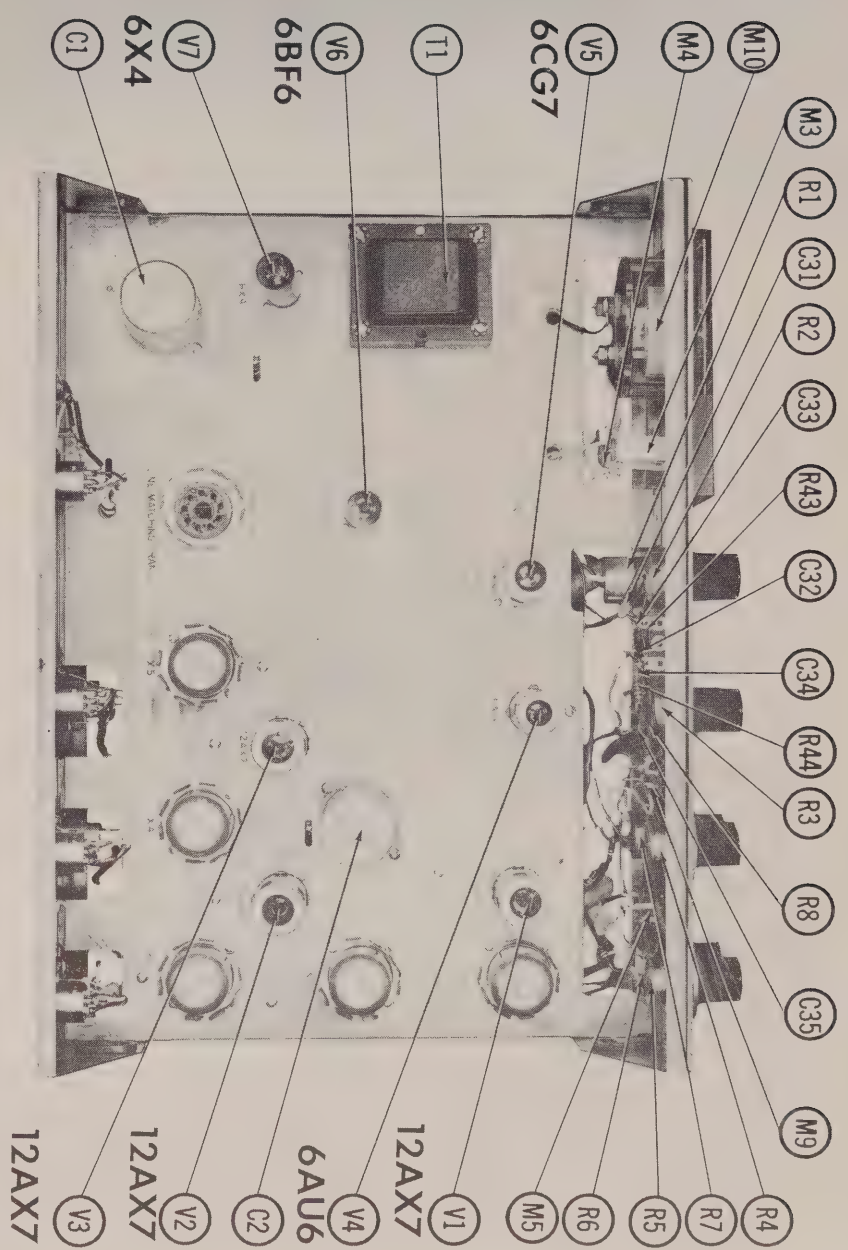
ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	David Bogen PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▰10	450		AFH4-10	D0090	FP434	TMQ-10	Q-030	TVL-4760
B	■10	450							
C	▲10	450							
D	10	450							
C2A	▰5	200		AFH4-09	D0080	WP433.6	TMQ-9	Q-027	TVL-4759.7
B	■5	200							
C	▲5	200							
D	5	200							
C3	5	200		PRS250V4	BBR4-250	TC50X	TD-4-450	MT-4504	TVA-1501
C4	4	15		SRE25V5	BBR4-50	TC30	TD-4-25	MT-0504	TVA-1402
C5	5	200		PRS250V4	BBR4-250	TC50X	TD-4-450	MT-4504	TVA-1501

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	100			NPO-DI 100	DD-101	L10T1	ZT-531	5TCC-T1	10%
C7	.033	200		P288N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C8	4700								10%
C9	2200								10%
C10	15000			BPD-015		BYA10S15		10HKB-S15	
C11	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C12	.033	200		P288N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C13	.033	200		P288N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C14	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C15	1500								10%
C16	1500								10%
C17	.033	200		P288N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C18	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C19	1500								10%
C20	1500								10%
C21	.033	200		P288N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C22	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C23	1500								10%
C24	1500								10%
C25	.033	200		P288N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C26	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C27	1500								10%
C28	1500								10%
C29	.047	200		P288N-047	DF-503	CUB2S47	GEM-4147	2TM-S47	
C30	.22	200		P288N-22		CUB2P22	GEM-2022	2TM-P22	
C31	330				MD-331	L10T33			10%
C32	27			NPO-DI 27	DTZ-27	C10Q27C			NPO 10%
C33	680				MD-681				10%
C34	680				MD-681				10%
C35	3300								10%
C36	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C37	.022	200		P288N-022	DD-203	CUB4S22	GEM-4122	2TM-S22	
C38	15000			BPD-015		BYA10S15		10HKB-S15	
C39	15000			BPD-015		BYA10S15		10HKB-S15	
C40	.47	400		P488N-47		CUB4P47	GEM-4047	4TM-P47	
C41	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	David Bogen PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	V377	B-60	A47-500K-Z	Q13-133	U48	Master Gain
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R2A	2meg	½	V413	B-76	A47-2meg-Z	Q13-139	U55	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	2meg	½	V413	B-76	A47-2meg-Z	Q13-139	U55	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Input
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Mic 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R6A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Mic 3
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R7A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Mic 4
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R8A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Mic 5
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

* Use KR with CRL "Red Label" Controls and KB with "Blue Label" Controls.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		David Bogen PART No.	NOTES
	OHMS	WATT		
R9	100K			
R10	3.3meg			
R11	330K			
R12	150K			
R13	680K			
R14	56K			
R15	3.3meg			
R16	330K			
R17	47K			
R18	3.3meg			
R19	330K			
R20	47K			
R21	470K			
R22	3.3meg			
R23	330K			
R24	47K			
R25	470K			
R26	3.3meg			
R27	330K			
R28	47K			
R29	470K			
R30	3.3meg			
R31	330K			
R32	47K			
R33	470K			

ITEM No.	RATING		David Bogen PART No.	NOTES
	OHMS	WATT		
R34	220K			
R35	220K			
R36	220K			
R37	220K			
R38	220K			
R39	470K			
R40	100K			
R41	1.5meg			
R42	390Ω			
R43	680K			
R44	82K			
R45	220K			
R46	3300Ω			
R47	220K			
R48	750Ω 5%			
R49	18K	2		
R50	330K			
R51	220K			
R52	56K			
R53	47K	1		
R54	1500Ω			
R55	4700Ω	2		
R56	4700Ω	2		
R57	15K	1		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .33A	640VCT @ .015A	6.3VCT @ 2.8A	T-3161						

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			David Bogen PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	1A 125V S/B			31300L (3AG 1A 125V S/B)	342001	MDL1	HKP

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		David Bogen PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N51		1N34	1N34A	Level Meter Rect. (Pigtail)

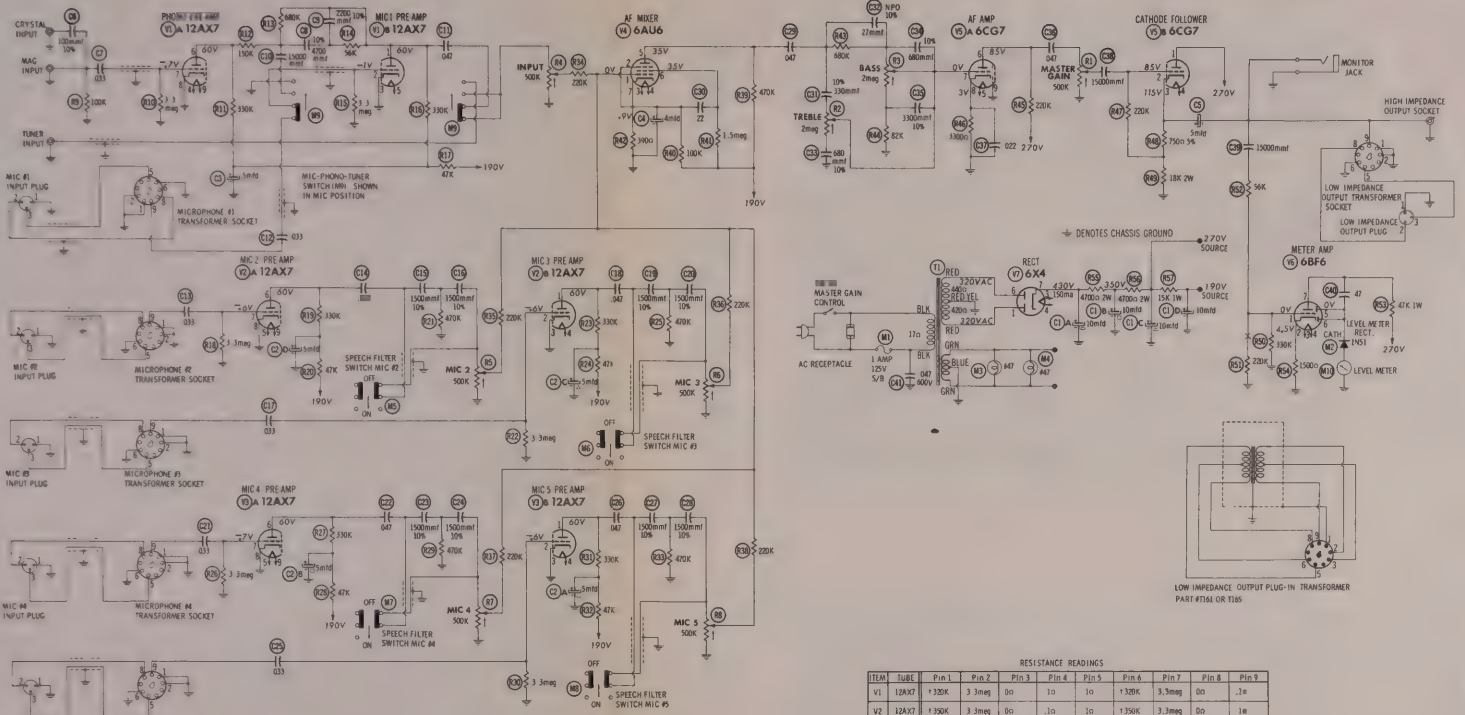
MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M3	Lamp		#47
M4	Lamp		#47
M5	Switch	S381	Filter 2, DPDT Slide Switch
M6	Switch	S381	Filter 3, DPDT Slide Switch
M7	Switch	S381	Filter 4, DPDT Slide Switch
M8	Switch	S381	Filter 5, DPDT Slide Switch
M9	Switch	S475	Mic-Phono-Tuner, 3 Position Slide Switch
M10	Meter	H620	Level Meter

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†320K	3.3meg	0Ω	1Ω	1Ω	†320K	3.3meg	0Ω	.1Ω
V2	12AX7	†350K	3.3meg	0Ω	.1Ω	1Ω	†350K	3.3meg	0Ω	1Ω
V3	12AX7	†350K	3.3meg	0Ω	.1Ω	.1Ω	†350K	3.3meg	0Ω	1Ω
V4	6AU6	4.5meg	370Ω	.1Ω	.1Ω	†490K	†1.5meg	370Ω		
V5	6CG7	†9480Ω	24DK	18K	1Ω	1Ω	†220K	82K	3300Ω	NC
V6	6BF6	120K	1500Ω	1Ω	.1Ω	1000Ω	1000Ω	†56K		
V7	6X4	440Ω	NC	1Ω	1Ω	NC	420Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 7 OF V7
NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected.

◎ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

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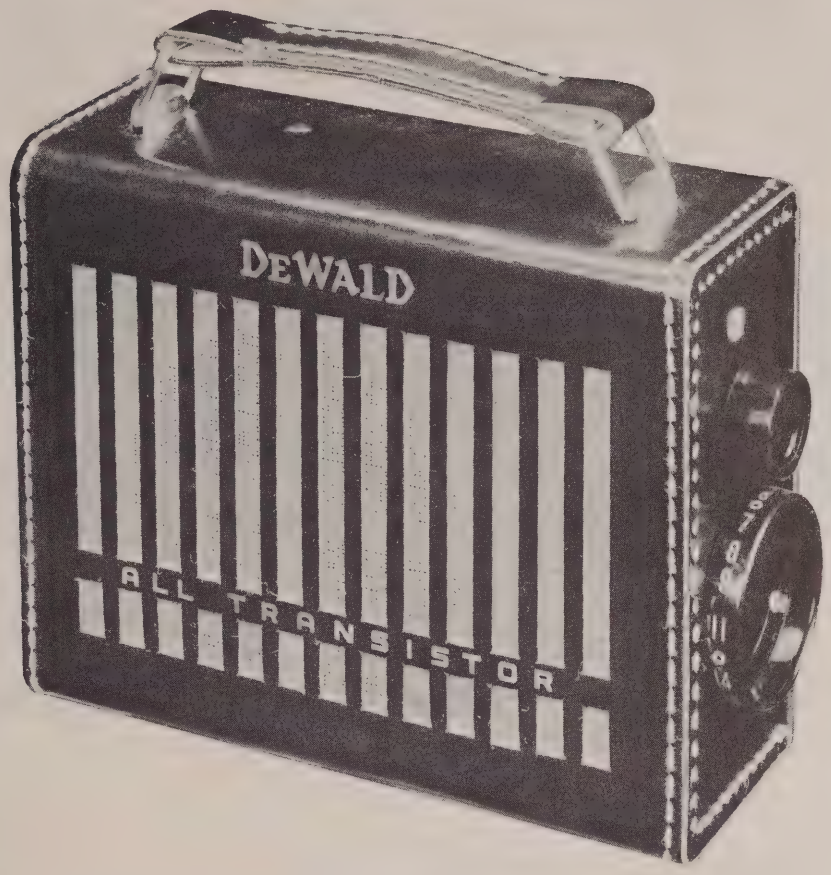
*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

DEWALD MODEL L-414

DEWALD
MODEL L-414



DEWALD
MODEL L-414

TRADE NAME	DeWald Model L-414
MANUFACTURER	DeWald Radio Mfg. Corp., 35-15 37th Ave., Long Island City 1, N. Y.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC
TUNING RANGE—BROADCAST	540 - 1650KC
RATING	17MA @ 9 Volts DC (No signal, Min. Volume) 19MA @ 9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1650KC	"	"	A3	"
3.		"	600KC	600KC	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang. Repeat steps 2 and 3.
4.		"	1400KC	Tune to 600KC signal	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

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PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N168A	Converter	CBS-2N439			2N212	NPN
X2	2N168A	Reflex IF Amplifier				2N212	NPN
X3	2N241A	Output	CBS-2N180	2N270	2N362	2N241A	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	DEWALD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	7	E-221	PWE10050	NL50-10	TT10X50	ML50-15	MQ-0650	TE-1160

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	DEWALD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.02	200		P288N-02	DD-203	CUB2S2	GEM-412	2TM-S2	
C3	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C4	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C5	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C6	2000			BPD-002	DD-202	BYA10D2	UC-522	5GA-D2	
C7	.02	200		P288N-02	DD-203	CUB2S2	GEM-412	2TM-S2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	DEWALD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A B	2000Ω Switch	½	V-317			Q13-111 76-1		Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

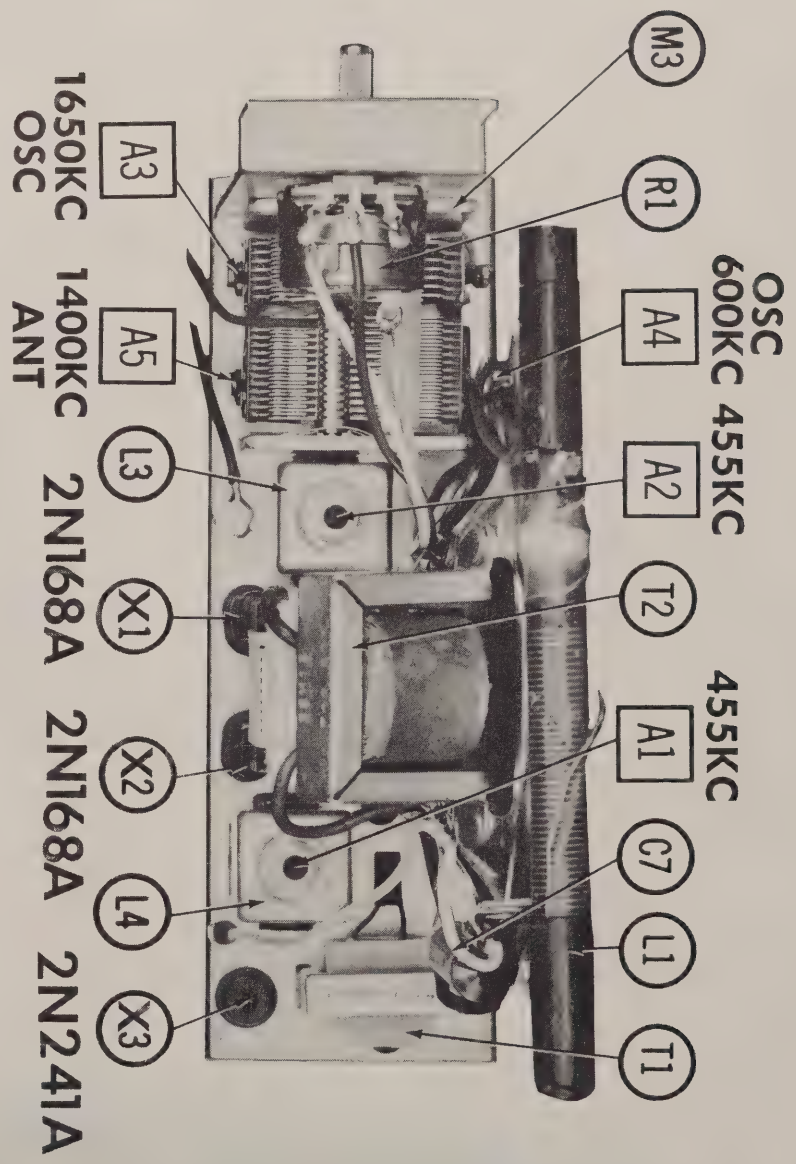
ITEM No.	RATING		DEWALD PART No.	NOTES
	OHMS	WATT		
R2	47K			
R3	10K			
R4	1500Ω			
R5	270Ω			

ITEM No.	RATING		DEWALD PART No.	NOTES
	OHMS	WATT		
R6	56K			
R7	1000Ω			
R8	4700Ω			
R9	100Ω			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		DEWALD PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loop Stick	L-161-1					
L2	Osc. Coil	O-159-1	14-9010	BC-403	2022		
L3	Input IF	I-162-1					
L4	Output IF	I-162-1					

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	DEWALD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4.5	: 1	T-160-1						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	DEWALD PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	588Ω	3-4Ω	38H13							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	DEWALD PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	S-716-1	4A07	

BATTERIES

ITEM No.	VOLTAGE	DEWALD PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			M6		266		M1605	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		DEWALD PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N60		1N64	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M3	Tuning Cap.	V-217-4	2 Gang (Ant. 37-400mmf, Osc. 20-110mmf)

CABINETS & CABINET PARTS

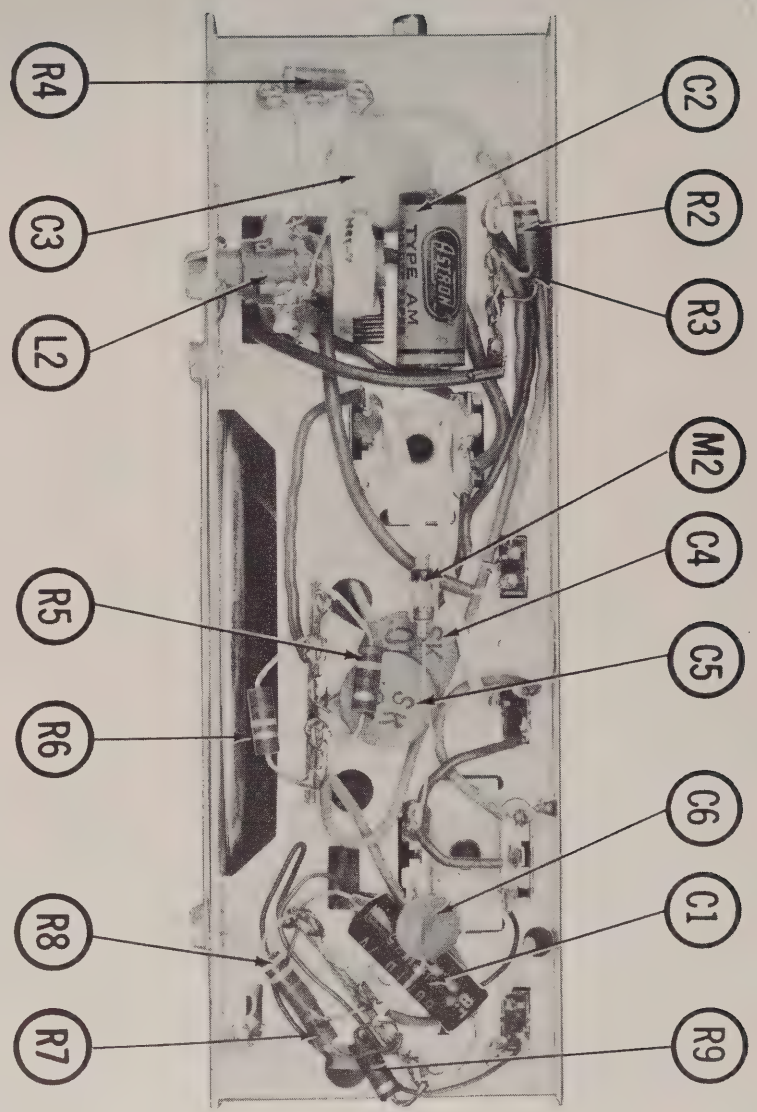
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

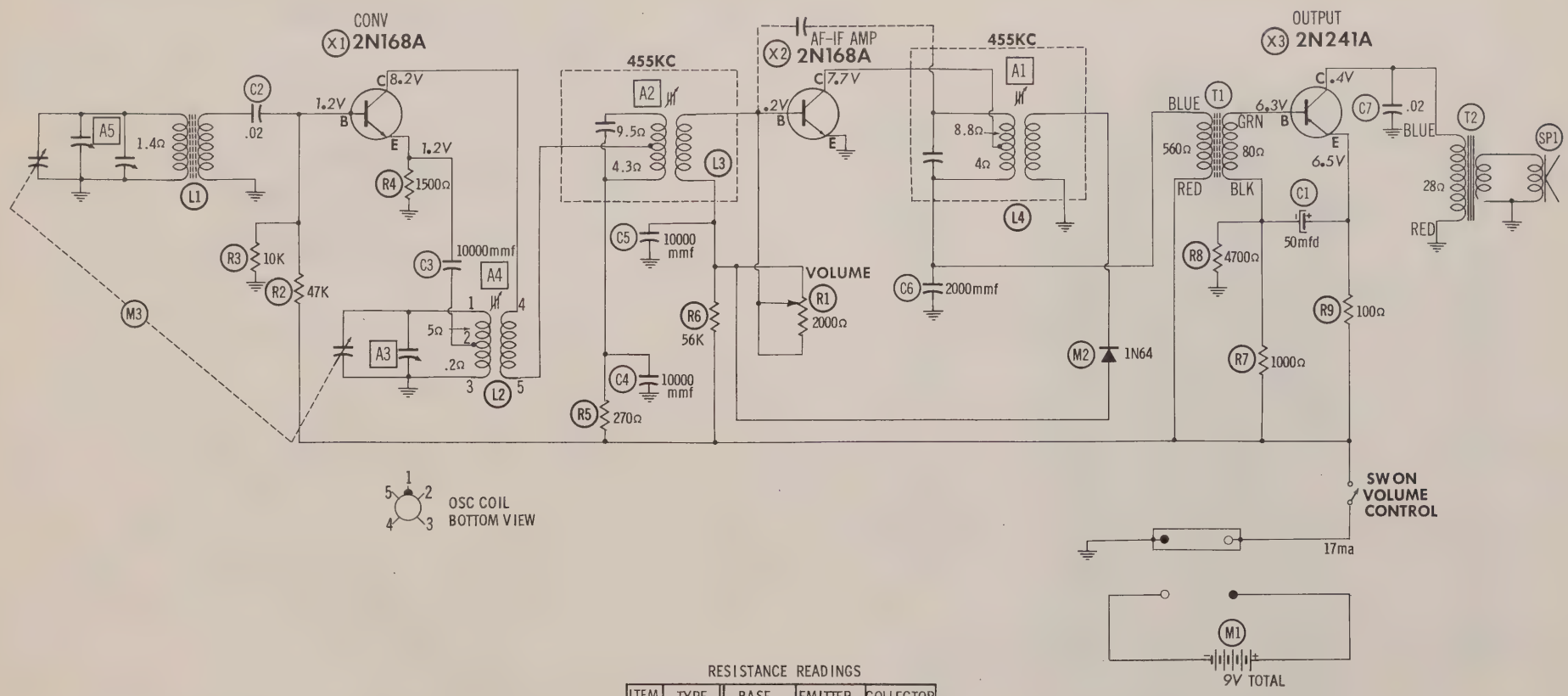
NAME	PART NO.	DESCRIPTION
Knob	K-467	Tuning
Knob	K-405	On-Off-Volume
Cabinet	C-478	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N168A	800Ω	1500Ω	† 270Ω
X2	2N168A	† 45K	0Ω	† 560Ω
X3	2N241A	† 1000Ω	† 100Ω	28Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R7 AND R9.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

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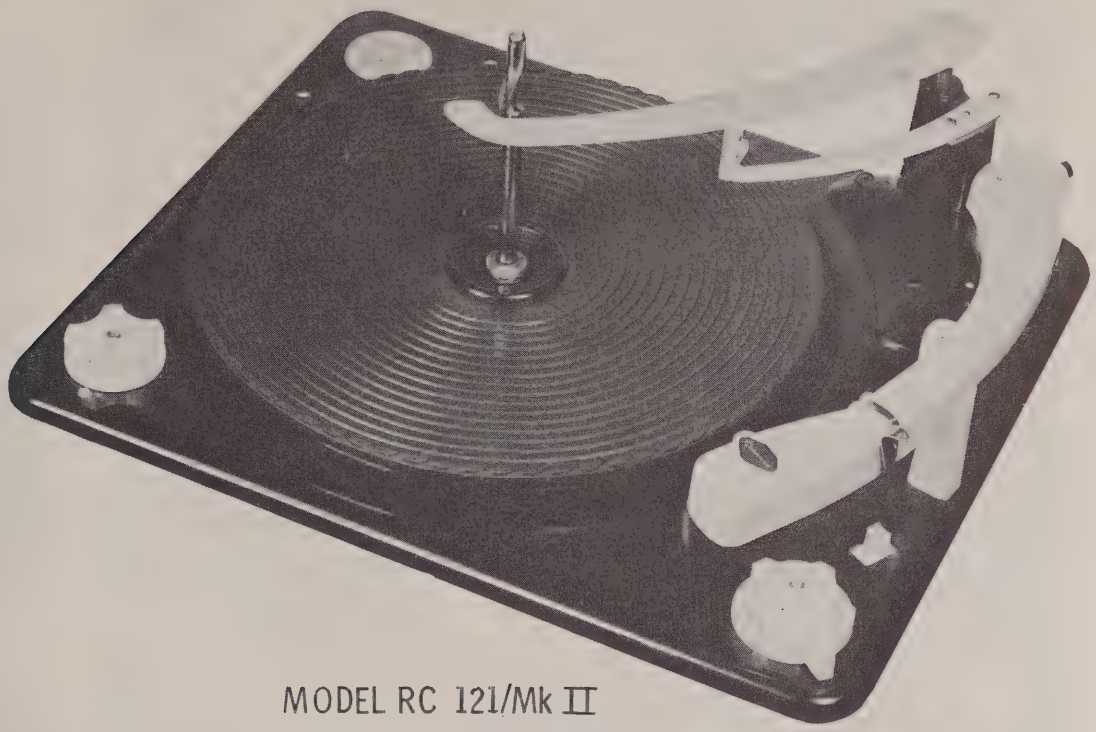
GARRARD MODELS
RC 120/Mk. II, RC 121/Mk. II



MODEL RC 121/Mk II

GENERAL INFORMATION

Garrard Models RC 120/ Mk. II and RC 121/ Mk. II record changers play four speeds--78, 45, 33 1/ 3, and 16 2/ 3 rpm.

The Model RC 120/ Mk. II has a one-piece, die-cast aluminum pickup arm, while the Model RC 121/ Mk. II has a plug-in pickup head. Except for this one difference, both models are exactly alike, and any reference to one model also applies to the other, unless otherwise stated.

Records of the same speed can be played at the same load if the smaller records are placed above the larger ones. Ten 45-rpm records, having the large center hole, may be played by using the Garrard large record spindle Type LRS 4, or center hole clip-in adaptors may be used.

Records may be rejected, played manually, or the changer may be stopped and restarted without rejecting the record being played.

Manufactured by:

The Garrard Engineering and Manufacturing Company, Limited
Newcastle Street
Swindon, Wilts., England

Distributed in the United States by:

Garrard Sales Corporation
80 Shore Road
Port Washington, New York

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SET 421 FOLDER 7

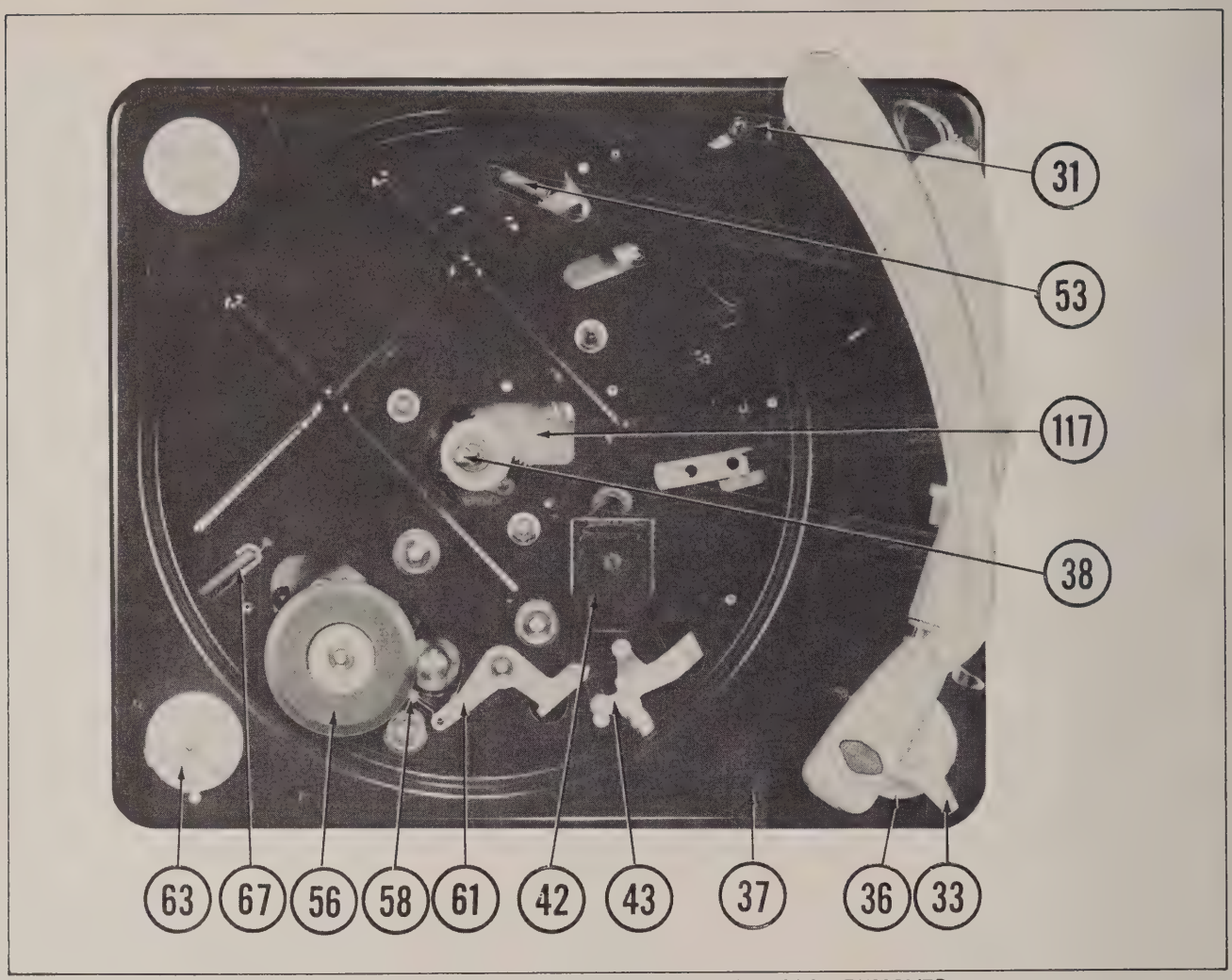

FIG. 1 CHANGER MECHANISM WITH TURNTABLE REMOVED

OPERATING INSTRUCTIONS

To Operate The Garrard Changer:

1. Release pickup arm latch (9).
2. Set stylus for type of record to be played.
3. Set Speed Control knob.
4. Set records on record spindle (38) and move overarm (1) inward.
5. Switch on mechanism, using Auto. Control knob for automatic operation or Manual Control knob for manual operation.

To Reject

To reject a record, move Auto. Control knob to On. Pickup arm (16) will lift from the record being played and return to its rest, and the next record will drop. If no more records are on record spindle (38), the changer switches off automatically.

To Stop

To stop the changer without rejecting the record being played, move the Stop lever knob forward. This action switches off the changer, but leaves the pickup on the record. Switch on the mechanism with the lower Manual Control knob. The changer will continue to play the same record from the same point where it stopped.

Manual Operation

To play a record manually, move overarm (1) outward, place record on record spindle (38), threading the record over the offset step on the spindle. Turn the Manual Control knob to On and place pickup on the record. The automatic trip will return the pickup to its rest when the record is finished.

To Switch Off

To switch off the changer while leaving the pickup on its rest, move the Auto. Control knob to Off. The pickup will lift and return to its rest, and the changer will switch off.

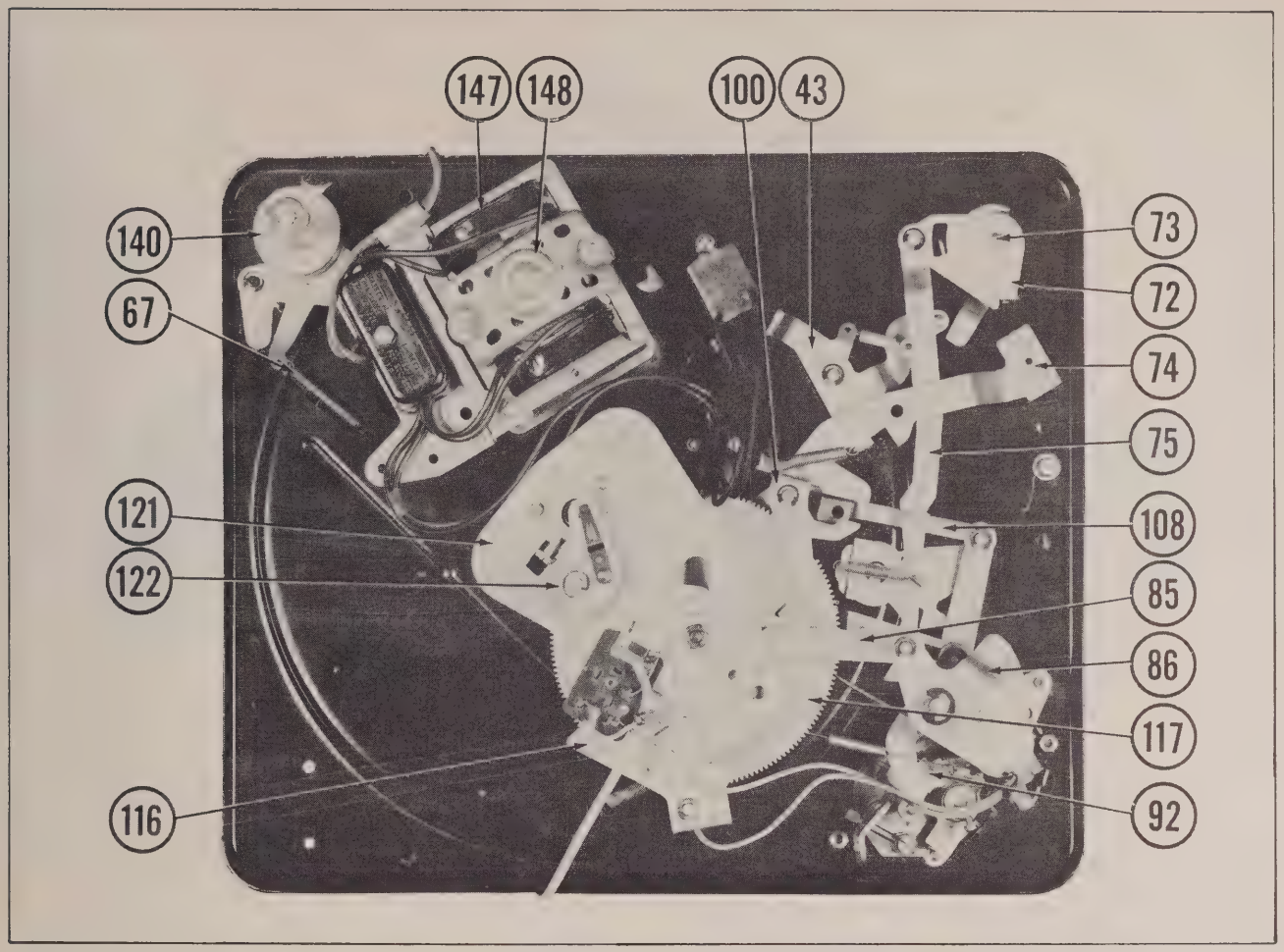

FIG. 2 BOTTOM VIEW OF CHANGER MECHANISM

To Play 45-rpm Records

To play 7", 45-rpm records with a 1 1/2" center hole, and using the large record spindle Type LRS 4:

1. With pickup arm (16) on its rest, place the LRS 4 spindle, with the arrow pointing to the front of the changer, over record spindle (38) and push down firmly.

2. Load any number of records up to 10 on the spindle and move overarm (1) inward, allowing it to rest on top of the spindle instead of on top of the records. This step is essential to insure correct changer operation and record selection.

3. To remove records, wait until the changer has stopped automatically. Then swing overarm (1) outward. Remove the records from the spindle by placing the thumbs on the outer edge of the records.

4. Before removing the LRS 4 record spindle, make sure the changer is in its rest position, with overarm (1) moved to the right. Then lift off spindle.

LUBRICATION

Because the motor and intermediate wheel bearings are of the oil retaining type, they rarely need lubricating.

Should lubrication be necessary, hold the intermediate wheel out of the way and lubricate the top of the motor bearings with a drop of fine grade light machine oil. Remove all traces of surplus oil before running the unit. The intermediate wheel rubber tire, motor pulley, and inside of the turntable rim must be kept free of oil or grease; otherwise, the drive will slip.

Occasionally a smear of light grease should be applied to all cam faces, and all lever pivots should be lightly lubricated.

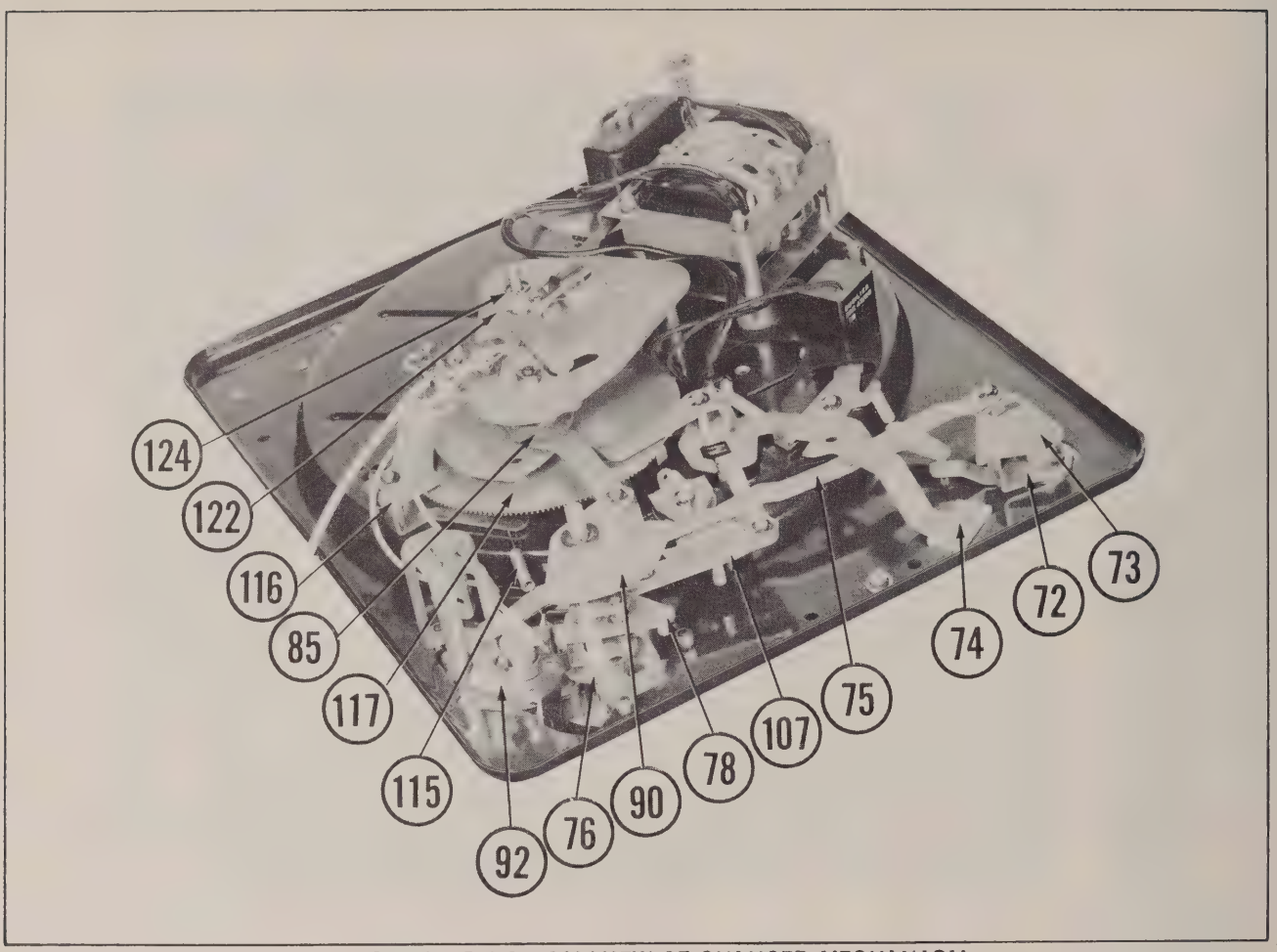

FIG. 3 TILTED BOTTOM VIEW OF CHANGER MECHANISM

CHANGE CYCLE

Observe the change cycle operation by manually rotating the turntable. The following action can then be readily followed and the function of each part easily understood.

The automatic trip mechanism operates on the velocity trip principle--the mechanism operates only when the inward motion of the pickup reaches the lead-out grooves at the end of the record. The trip is set to commence when the pickup reaches a raidus of 2 5/ 8", and it should operate on an acceleration of not less than 3/ 32" with at least 1 1/ 2 revolutions of a record.

The trip mechanism is mounted on cam gear (117) and can be seen by removing the turntable when the changer is in its playing position. Trip pawl (127) is pivoted on cam gear (117) and is moved inward by the motion of the pickup arm through friction lever (126) toward turntable spindle (38). A projection on the turntable spindle (point "A" on Exploded View), called the striker, pushes trip pawl (127) back against the light friction of friction lever (126), trying to move it inward. This action occurs as long as the pickup is moving slowly, such as when in the playing grooves of a record. This action begins when the pickup reaches a radius of 2 7/ 8" and continues until the inward motion of the pickup is accelerated. Trip pawl (127) is then pushed inward too far to be pushed back by the striker. The striker (point "A" on Exploded View) then positively engages trip pawl (127), pushing cam gear (117) so that the teeth of cam gear (117) engage those on the turntable.

As cam gear (117) begins rotating, the eccentric part of the cam gear contacts cam link (85) and moves it toward the turntable spindle. Cam link (85) and pickup cam (86) are connected and move in unison. As pickup cam (86) begins moving, the cam surface on the rear of pickup cam (86) pushes lifting spindle (82) upward, raising the pickup arm clear of the record. Pickup cam (86), still moving, contacts pickup lever (78), which is connected to pickup arm (16). As pickup lever (78) moves outward, so must the pickup arm move outward toward pickup rest body (8).

After cam gear (86) has raised the pickup arm and is moving it outward, cam gear (86), still rotating, contacts release lever (122), through the action of record spindle cam (150) lower part of cam gear (86). Release lever (122) then actuates record spindle (38), thereby dropping a record to the turntable.

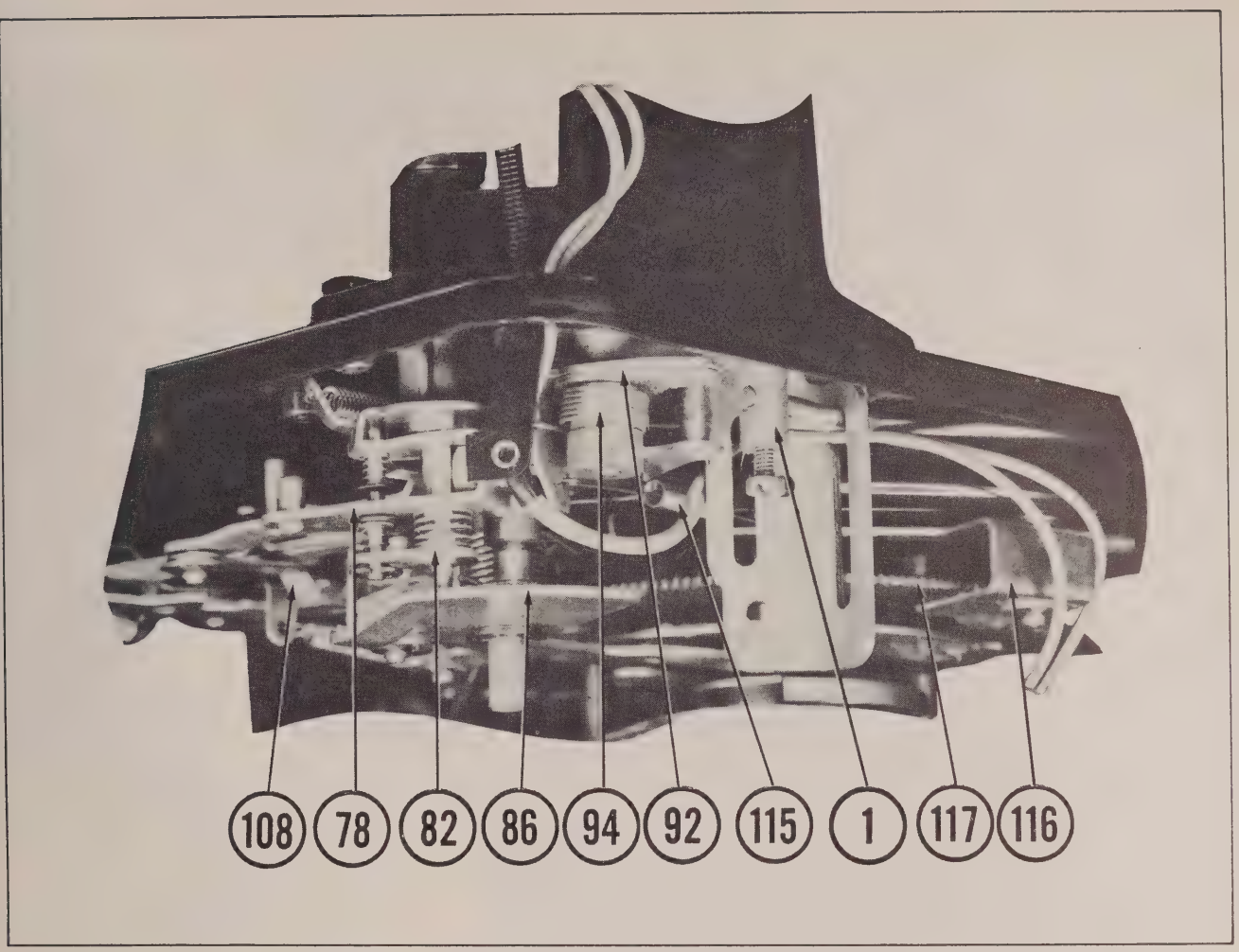

FIG. 4 SIDE VIEW OF TONE ARM OPERATING MECHANISM

Simultaneously, record selection takes place. To observe how 10" and 12" records are selected, place a 10" record on the record spindle with a 12" record above it. Now move overarm (1) inward. Selector arm (4) moves inward, allowing the transparent plastic record selector attached to it to touch the edge of the 12" record, with the flared portion of the record cam projection underneath the record. When the 10" record drops, the selector arm is moved back. Selector lever (92) is connected to the bottom of the selector arm shaft and is moved back at the same time. Selector lever (92) is now in the 10" position. As the pickup arm moves in toward the spindle, interselector lever (76) drops into the 10" notch on selector lever (92), stopping the pickup arm over the 12" record lead-in groove. With a 7" record, selector arm (4) is moved farther than with the 10" and 12" records. Therefore, interselector lever (76) drops into the 7" notch on selector lever (92), stopping the pickup arm over the 7" record lead-in groove.

While the cam gear continues rotating, cam link (85) changes direction, thereby moving pickup cam (86) back to its original position. This action allows the lifting spindle to move down and the pickup to set down on the record. As the pressure is released from lifting spindle (82), cam gear (117) is at a point where the teeth run out and the turntable spindle no longer controls its movement.

After the mechanism has been tripped, it again follows the preceding sequence of cycling and playing the records until the last record of the stack has been played.

As the last record of the stack drops to the turntable, the pickup arm is moved back to pickup rest body (8). Selector arm (4) also moves toward record spindle (38), seeking the edge of the record. Because the last record has dropped, selector arm (4) moves almost to the center of the turntable, taking selector lever (92) with it, which pivots knock-off lever (107) toward record spindle (38). Because the auto. stop lever is connected to knock-off lever (107) by a friction arrangement, the auto. stop lever is also moved toward record spindle (38). When the knock-off lever is moved inward far enough to engage the projection on cam gear (117), the knock-off lever is forced back toward the pickup arm, forcing control link (75) back and out of engagement with stop catch lever (104). Control lever (73) is then free to move to the off position. As control lever (73) moves to the off position, switch lever (43) actuates switch block (42), removing power from the motor and stopping the mechanism.

As cam gear (117) moves to the out-of-cycle position, lifting spindle (82) rides down the incline of pickup cam (86), lowering the pickup arm to the pickup rest body (8).

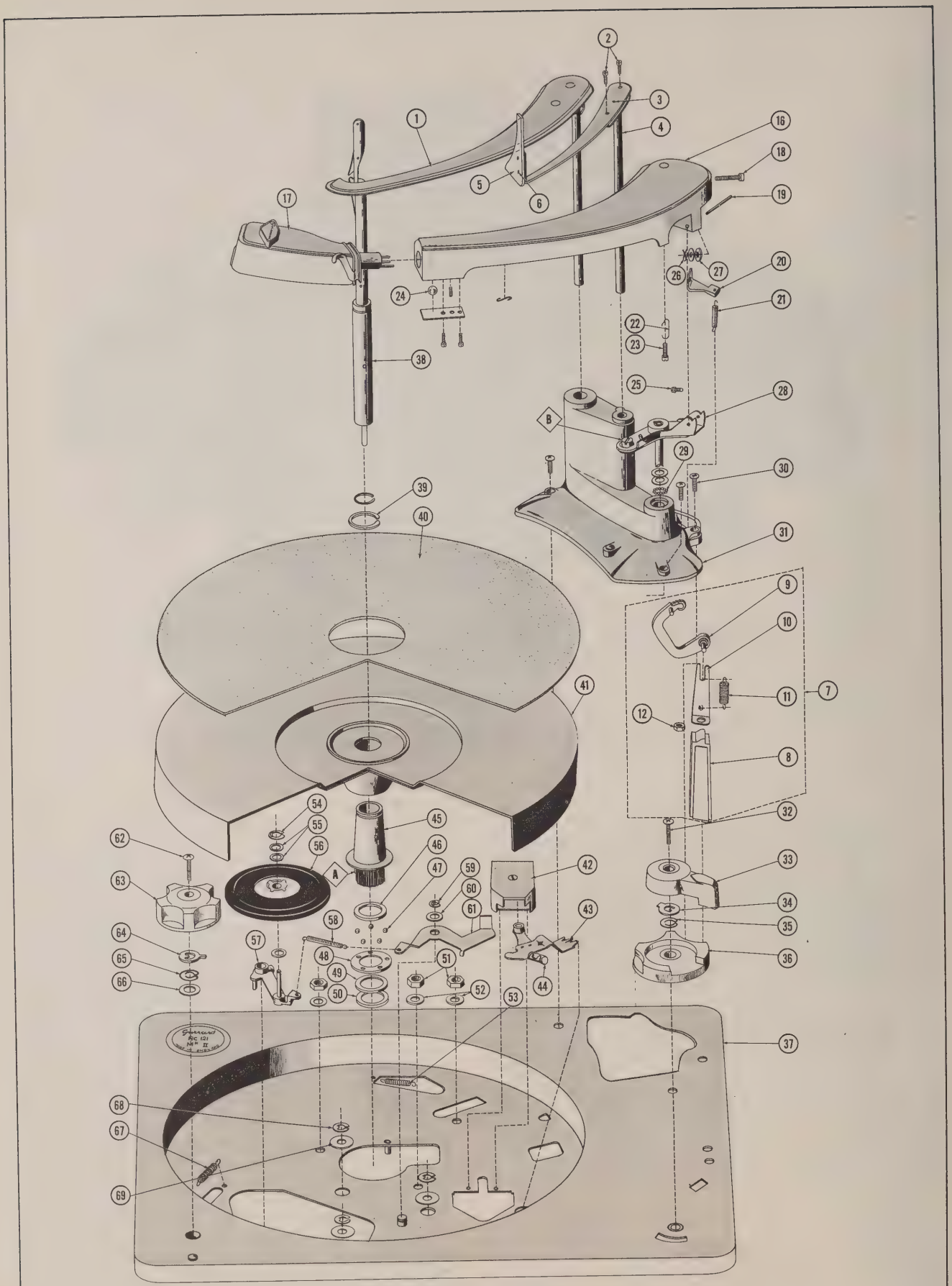

FIG. 5A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

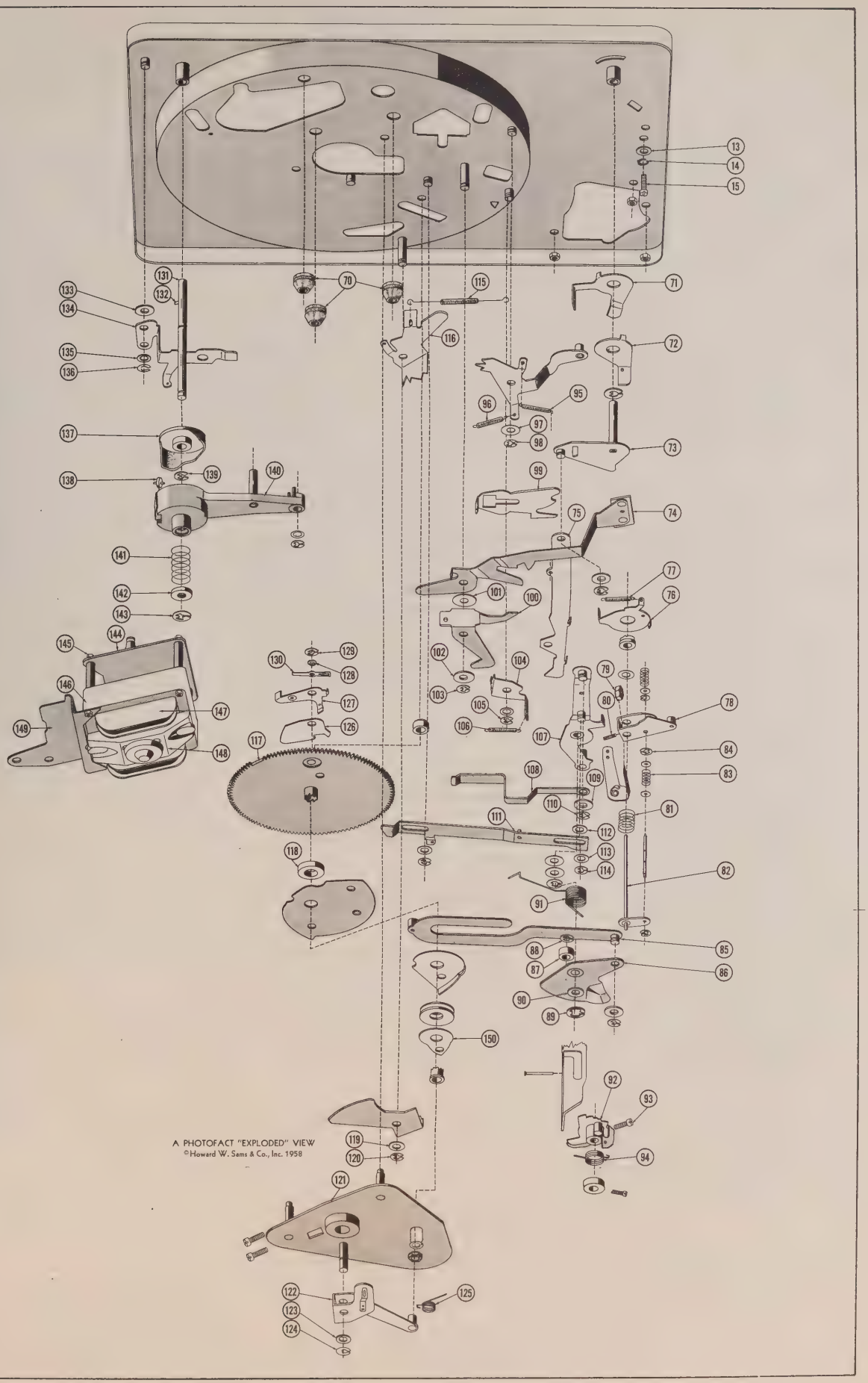

FIG. 5B EXPLODED VIEW OF PARTS BELOW BASEPLATE

Pickup Setdown

To set the pickup dropping position, place a record on record spindle (38), switch on the changer, and when the record drops, switch off the changer with the Stop button. Slowly turn the turntable by hand until the stylus point is about 1/8" above the record. By viewing from the front, the position of the stylus in relation to the record can be seen. To gain access to the adjustment, lift the pickup arm as far as it will go. On pickup arm pivot bracket (28) are a large and a small slotted screw head. Release the small screw and turn the large one (point "B" on Exploded View), which has an eccentric attached to it, a fraction of a turn. Then lower the arm and check the stylus position. If further out, turn the large screw in the opposite direction. When the correct position is found, retighten the small screw.

Pickup Height

Adjust the pickup height by turning height adjusting screw (23), at top rear of the pickup arm, clockwise to raise and counterclockwise to lower the pickup.

Stylus Pressure

Stylus pressure counterbalance screw (18) is at the rear of the pickup arm and is serrated for easier finger adjustment. Turning the screw clockwise reduces the pressure; counterclockwise, increases it. Set the height so that the stylus point is 1" above the top face of one record on the turntable when the pickup has lifted and is returning to its rest.

Stylus pressure should not exceed 10 grams.

Record Selector Arm

The position of selector arm (4) is set initially with the screw in the bushing of selector lever (92), at the lower end of the selector arm assembly. The final fine adjustment is made by turning eccentric adjustment screw (3) on top of selector arm (4). This adjustment is the only one that should be used for normal servicing. At the top rear of selector arm (4) are three screws. The small center screw is eccentric adjustment screw (3). To adjust, loosen the outer screws (2), turn the center one, then retighten the two outer screws.

TROUBLE CHART

Symptom	Cause	Remedy
Pickup arm fails to track. (The stylus jumps the record grooves.)	1. Worn stylus.	1. Replace stylus.
	2. Pickup leads binding the movement of the arm.	2. Loosen pickup leads.
	3. Insufficient stylus pressure.	3. See stylus pressure adjustment under "Adjustments."
	4. Trip pawl (127) not free, and its movement is obstructed by dirt on the face of cam gear (117).	4. Clean the face of cam gear (117).
Erratic Turntable speed.	1. Stepped pulley on motor shaft is loose.	1. Tighten stepped pulley
	2. Incorrect position of stepped pulley.	2. Intermediate wheel should engage the correct pulley step, according to the speed indicated by the knob.
	3. Oil or dirt on inside of turntable rim, motor pulley surface, or face of intermediate wheel (56).	3. Wipe with a clean rag to remove all traces of dirt or oil.
Rumble.	1. Motor bearings dry.	1. Oil sparingly.
	2. Motor not free on its rubber suspensions.	2. Reposition the motor on its rubber suspensions.
	3. Motor leads binding.	3. Loosen motor leads.

TROUBLE CHART (Con't)

Symptom	Cause	Remedy
	4. Dirt on turntable spindle thrust washers (46) and (49).	4. Remove turntable and turntable spindle (45). Clean ball bearings (47) and thrust washers (46) and (49). Examine the bearing faces of the thrust washers; they should be perfectly smooth, flat, and free from blemishes. If necessary, replace with new ones. Then apply a very thin grease on reassembled turntable spindle (45).
Automatic trip fails to function properly.	1. Friction lever (126) has too light friction, causing the striker (point "A" on Exploded View) to contact trip pawl (127) and push it back. Thus, it will not engage again for several revolutions of the turntable, causing the trip to fail.	1. Increase pressure of friction spring (130) by removing spring clip (129) and friction spring (130). Carefully bend friction spring (130) slightly and replace it.
	2. Friction lever (126) is obstructed by dirt on face of cam gear (117).	2. Dismantle trip pawl (127) by removing spring clip (129) and examine trip pawl (127) for dirt or burrs. Remove all obstructions.
Record sound distorted.	1. Defective cartridge.	1. Replace.
	2. Defective amplifier.	2. Check phonograph amplifier and speaker. If defective, repair or replace.
	3. Defective wiring.	3. Check pickup leads for short or open lead.
	4. Loose cartridge terminal clips.	4. Remove, squeeze together slightly, and replace.
Record does not drop when changer cycles.	1. Release spring (125) disconnected.	1. Replace release spring (125).
	2. Record spindle (38) latches stuck.	2. Clean record spindle (38) and remove all obstructions.
Turntable does not revolve when manual control is turned on.	1. No current at motor.	1. Check that current is reaching AC leads of changer and that switch functions properly.
	2. Motor defective.	2. Remove turntable to allow motor to operate without load. If current is reaching motor and pulley does not rotate, the motor is defective. Repair or replace.
	3. Intermediate wheel not engaging turntable rim.	3. Check that tension spring (58) is in place. If not, replace. Also check for oil or dirt on intermediate wheel and rim. Clean with naptha or alcohol.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	B. 54846	Overarm With Spindle
2	A. 40353	Screw For Selector Arm (2)
3	A. 54733	Eccentric Adjustment Screw
4	A. 54692	Selector Arm
5	A. 54693	Record Cam
6	A. 44049	Fixing Screw (2)
7	A. 54626	P. U. Rest Complete. Comprising:
8	C. 54773	Pickup Rest Body
9	A. 54774	Latch Unit
10	A. 54716	Bracket
11	A. 41635	Spring
12	A. 41012	Nut
13	A. 40515	Washer
14	A. 42501	Spring Washer
15	A. 40155	Screw
16	B. 54720	RC. 120 Mk. II Pickup Arm Assy. Complete (Less Cartridge)
	B. 55130	RC. 121 Mk. II Pickup Arm Assy. Complete With Plug In Head (Less Cartridge)
17	A. 55246	MPM3 Plug In Pickup Head (Closed Front) Assembly Complete Less Cartridge
	A. 55249	MPM3 Plug In Pickup Head (Open Front) Assembly Complete Less Cartridge
18	A. 40483	Counterbalance Screw
19	A. 54734	Pivot Pin For P. U. Arm
20	A. 54572	Counterbalance Arm
21	A. 41805	Counterbalance Spring Model RC. 120 Mk. II
	A. 41821	Counterbalance Spring Model RC. 121 Mk. II
22	A. 41757	Locking Spring For Adj. Screw
23	A. 44043	Height Adjusting Screw
24	A. 43203	Steel Ball Model RC. 121 Mk. II
25	A. 40350	Screw Fixing Pivot Pin
26	A. 43348	Split Pin
27	A. 40511	Washer
28	A. 54676	Pickup Arm Pivot Bracket Complete With Spindle
29	A. 43204	Steel Balls
30	A. 44042	Fixing Screws For P. U. Base
31	C. 54667	P. U. Base Assembly Complete
32	A. 44039	Screw Fixing Control Knob
33	B. 54611	Auto Control Knob
34	A. 40830	Tab Washer For Auto Control Knob
35	A. 43807	Spring Clip Retaining Control Knob
36	B. 54609	Manual Control Knob
37	C. 54601	RC. 120 Mk. II Unit Plate Complete With Pivot Pins, Bushes For Control and Name Plate
	C. 55412	RC. 121 Mk. II Unit Plate Complete Pivot Pins, Bushes For Controls And Name Plate
38	B. 54638	Record Spindle With Latches, Pawl And Fixed Spindle
39	A. 53176	Spring Clip Retaining Turntable
40	C. 54848	Turntable Cover
41	B. 53394	Turntable
42	B. 51322	Switch Block
43	B. 55519	Switch Lever With Felt Pad and Contact
44	A. 45064	Felt Pad For Switch Lever
45	A. 54815	Turntable Spindle With Striker

Ref. No.	Part No.	Description
46	A. 40804	Thrust Washer (Small Hole)
47	A. 43201	Ball Bearing
48	A. 51224	Ball Race Cage
49	A. 40713	Thrust Washer (Large Hole)
50	A. 40789	Plastic Washer
51	A. 41006	Nut
52	A. 40695	Washer
53	A. 41808	Spring For Cam Selector Lever
54	A. 41723	Spring Clip Retaining Intermediate Wheel
55	A. 40774	Presspahn Washer For Intermediate Wheel
56	B. 53883	Intermediate Wheel With Bearing
57	A. 54984	Support Bracket With Pivot Pin For Intermediate Wheel (Small Casting)
58	A. 41792	Tension Spring
59	A. 41723	Spring Clip Retaining Switch Lever
60	A. 40695	Washer
61	A. 54616	Tension Lever
62	A. 44039	Screw Fixing Speed Control Knob
63	B. 54613	Speed Control Knob
64	A. 40830	Tab Washer For Speed Control Knob
65	A. 43807	Spring Clip
66	A. 40536	Steel Washer
67	A. 41661	Spring For Index Lever
68	A. 43800	Circlip Retaining Motor (3)
69	A. 40828	Washer (3)
70	A. 43109	Grommet Fixing Motor
71	A. 55522	Manual Control Lever
72	A. 54621	Return Lever
73	A. 54617	Control Lever With Pin And Spindle
74	A. 55408	Stop Lever Knob
75	A. 54620	Control Link
76	A. 54816	Pickup Base With Pickup Cam Spindle Guide Bracket, Inter Selector Lever And Spring Pin
77	A. 41506	Spring For Inter Selector Spindle
78	A. 54682	Pickup Lever With Lifting Pin And Spring Clips
79	A. 41006	Nut
80	A. 44041	Screw Fixing Pickup Lever
81	A. 41796	Return Spring
82	A. 54687	Lifting Spindle With Plate And Bush
83	A. 41833	Spring
84	A. 43803	Spring Clips (2)
85	A. 54663	Cam Link With Roller
86	A. 54710	Pickup Cam With Roller Pin, Roller And Spring Clip
87	A. 54714	Roller For Pickup Cam
88	A. 41723	Spring Clip Retaining Roller
89	A. 41788	Spring Clip Retaining Pickup Cam
90	A. 40503	Washer
91	A. 41834	Spring For Pickup Cam
92	A. 54694	Selector Lever With Selector Tension Lever, Bush And Spring
93	A. 40488	Screw Fixing Selector Lever
94	A. 41804	Spring
95	A. 41506	Spring For Control Link
96	A. 41631	Spring For Stop Cam Lever
97	A. 40695	Washer
98	A. 41723	Spring Clip Retaining Switch Lever
99	A. 54726	Fixing Plate For Stop Catch Lever
100	B. 54624	Stop Cam Lever

Ref. No.	Part No.	Description
101	A. 40512	Washer (Large)
102	A. 40535	Washer (Small)
103	A. 41723	Spring Clip Retaining Stop Cam Lever
104	B. 54725	Stop Catch Lever
105	A. 41723	Spring Clip Retaining Fixing Plate
106	A. 41503	Spring For Stop Catch Lever
107	A. 54698	Knock Off Lever With Bush And Pin
108	A. 54662	Stop Link
109	A. 40695	Washer For Stop Link
110	A. 41723	Spring Clip For Stop Link
111	A. 54659	Auto Stop Link With Pins
112	A. 40695	Washer (Thick)
113	A. 40836	Washer (Thin)
114	A. 41723	Spring Clip Retaining Auto Stop Link
115	A. 41801	Spring For Cam Selector Lever
116	B. 54625	Cam Selector Lever
117	B. 54642	Cam Assembly Complete With Cams
118	A. 54786	Spacer
119	A. 40695	Washer
120	A. 41723	Spring Clip Retaining Cam Selector Lever
121	A. 54630	Bridge With Turntable Spindle Housing And Pickup Connector
122	A. 54656	Release Lever With Spring Blade And Pin
123	A. 40695	Washer
124	A. 41696	Spring Clip Retaining Release Lever
125	A. 41824	Release Spring
126	A. 54645	Friction Lever
127	A. 55530	Trip Pawl Unit
128	A. 55507	Brass Collar

Ref. No.	Part No.	Description
129	A. 43803	Spring Clip
130	A. 41806	Friction Spring
131	A. 54709	Speed Change Spindle
132	A. 46680	Cross Pin For Speed Change Spindle
133	A. 40535	Washer (Thin)
134	B. 54619	Index Lever
135	A. 40836	Washer (Thick)
136	A. 41723	Spring Clip Retaining Index Lever
137	A. 54385	Cam For Speed Change
138		Pin And Roller
139	A. 41788	Spring Clip Retaining Cam
140	A. 54386	Support Lever With Pin And Roller (Large Casting)
141	A. 41786	Lifting Spring For Speed Change
142	A. 40817	Cupped Washer
143	A. 43807	Spring Clip
144	A. 54701	Motor Mounting Plate With Pillar
145	A. 40118	Screw Fixing Motor
146	B. 55150	Dual Range Motor Complete
	B. 54700	High Range Motor Complete
147	A. 53350	Bobbins Complete (Dual Range Motor)
	A. 53259	Bobbin (Left) Complete (High Range Motor)
	A. 53260	Bobbin (Right) Complete (High Range Motor Only)
148	A. 53962	Motor Cover (Top) With Bearing
	B. 53963	Motor Cover (Bottom) With Bearing
	A. 43209	Thrust Ball For Bottom Motor Cover
149	A. 40698	Washer (2) Or Collar A. 55320
150		Cam For Record Spindle (Part Of Item 86)

PHOTOFACT* Folder
*TRADE MARK

with CIRCUITRACE*
*TRADE MARK

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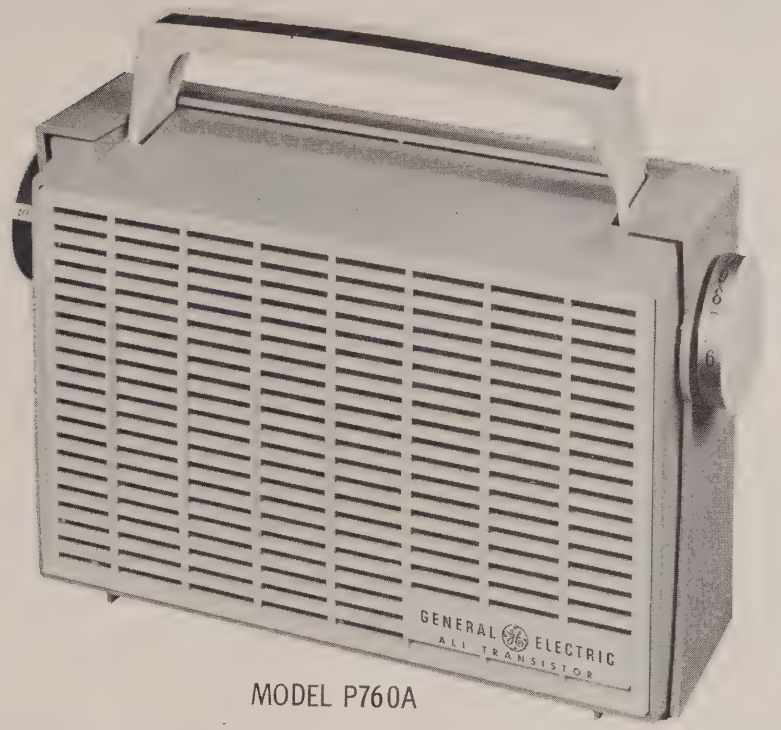
GENERAL ELECTRIC MODELS P760A, P761A

GENERAL ELECTRIC
MODELS P760A, P761A



MODEL P760A

GENERAL ELECTRIC
MODELS P760A, P761A

TRADE NAME	General Electric Models P760A, P761A
MANUFACTURER	General Electric Co., Products Service, Radio Receiver Dept., 869 Broad St., Utica, N.Y.
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	6 Volts DC
TUNING RANGE—BROADCAST	535-1620KC
RATING	68MA@6 volts DC (No signal, Min. volume) 69MA@6 volts DC (signal Normal volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400ΩMod.)	Tuning gang fully open	Across voice coil	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		Loop	1620KC	"	"	A4	"
3.		"	600KC	600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang. Repeat steps 2 & 3.
4.		"	1400KC	Tune for 1400KC Signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

DISASSEMBLY

1. Remove knobs.
2. Remove batteries.
3. Remove cabinet retainer strap
4. Disconnect speaker.
5. Remove 7 chassis mounting screws.
6. Remove chassis.

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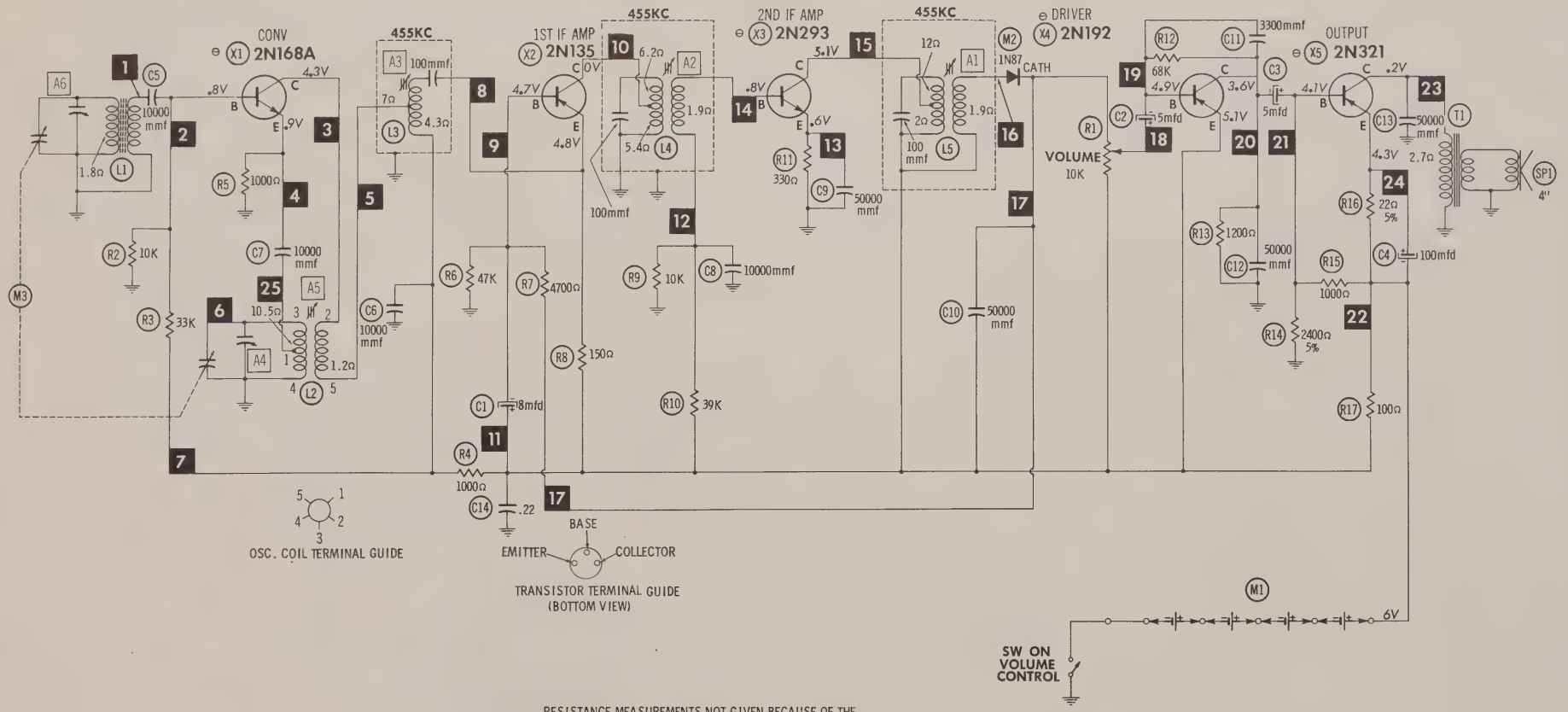
SET 421 FOLDER 8



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal apllied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N168A	Converter	CBS-2N439			2N212	NPN ①
X2	2N135	1st IF			2N482	2N139	PNP
X3	2N293	2nd IF	2N439			2N94	NPN ②
X4	2N192	Driver		2N407	2N362	2N213	PNP ③
X5	2N321	Output		2N270	2N360	2N383	PNP ④

① Alternate type 2N164A
② Alternate type 2N314
③ Alternate type 2N324
④ Alternate type 2N241A

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	G. E. PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	8	10		PWE10008	NL8-6	TT25X8	ML8-15		TE-1114
C2	5	10		PRS50V5	BBR5-50	TC30	TD-5-25	MMT-0505	TVA-1203
C3	5	10		PRS50V5	BBR5-50	TC30	TD-5-25	MMT-0505	TVA-1203
C4	100	3		PWE3100	NL100-3	TT6X100	ML100-3		TE-1060

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	G. E. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C6	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C7	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C8	10000			BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C9	50000			BPD-05	DF-503			5HK-S5	
C10	50000			BPD-05	DF-503			5HK-S5	
C11	3300			BPD-0033	DD-332	BYA10D33	UC-5233	5HK-D33	
C12	50000			BPD-05	DF-503			5HK-S5	
C13	50000			BPD-05	DF-503			5HK-S5	
C14	.22	100		P288N-22		CUB2P22	GEM-2022	2TM-P22	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	10K	½	RS-1347					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		G. E. PART No.	NOTES
	OHMS	WATT		
R2	10K			
R3	33K			
R4	1000Ω			
R5	1000Ω			
R6	47K			
R7	4700Ω			
R8	150Ω			
R9	10K			

ITEM No.	RATING		G. E. PART No.	NOTES
	OHMS	WATT		
R10	39K			
R11	330Ω			
R12	68K			
R13	1200Ω			
R14	2400Ω 5%			
R15	1000Ω			
R16	22Ω 5%			
R17	100Ω			

PRINTED BOARD

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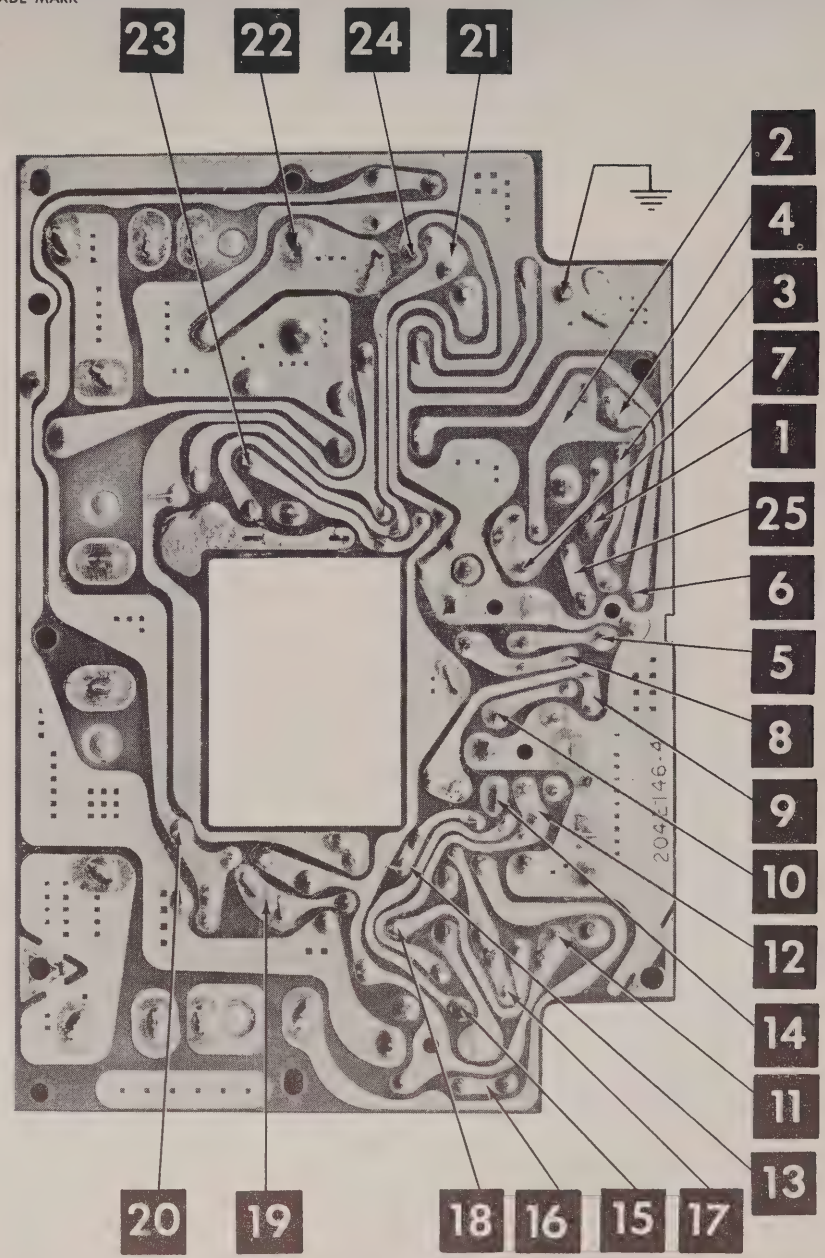


GENERAL ELECTRIC
MODELS P760A, P761A
FOLDER 8

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		G. E. PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loop Stick	RS-1429					
L2	Osc. Coil	RS-1427					
L3	1st IF	RS-1424					
L4	2nd IF	RS-1425					
L5	3rd IF	RS-1426					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	G. E. PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	130Ω	3-4Ω	RS-1428							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	G. E. PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	RB-1057	4A1	

BATTERIES

ITEM No.	VOLTAGE	G. E. PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	6V			2R①		950①		M-13R①	① 4 used

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		G. E. PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N87		1N64	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	G. E. PART No.	NOTES
M3	Tuning Cap. Printed board	RS-1346 204E146-4	Two-gang

CABINETS & CABINET PARTS

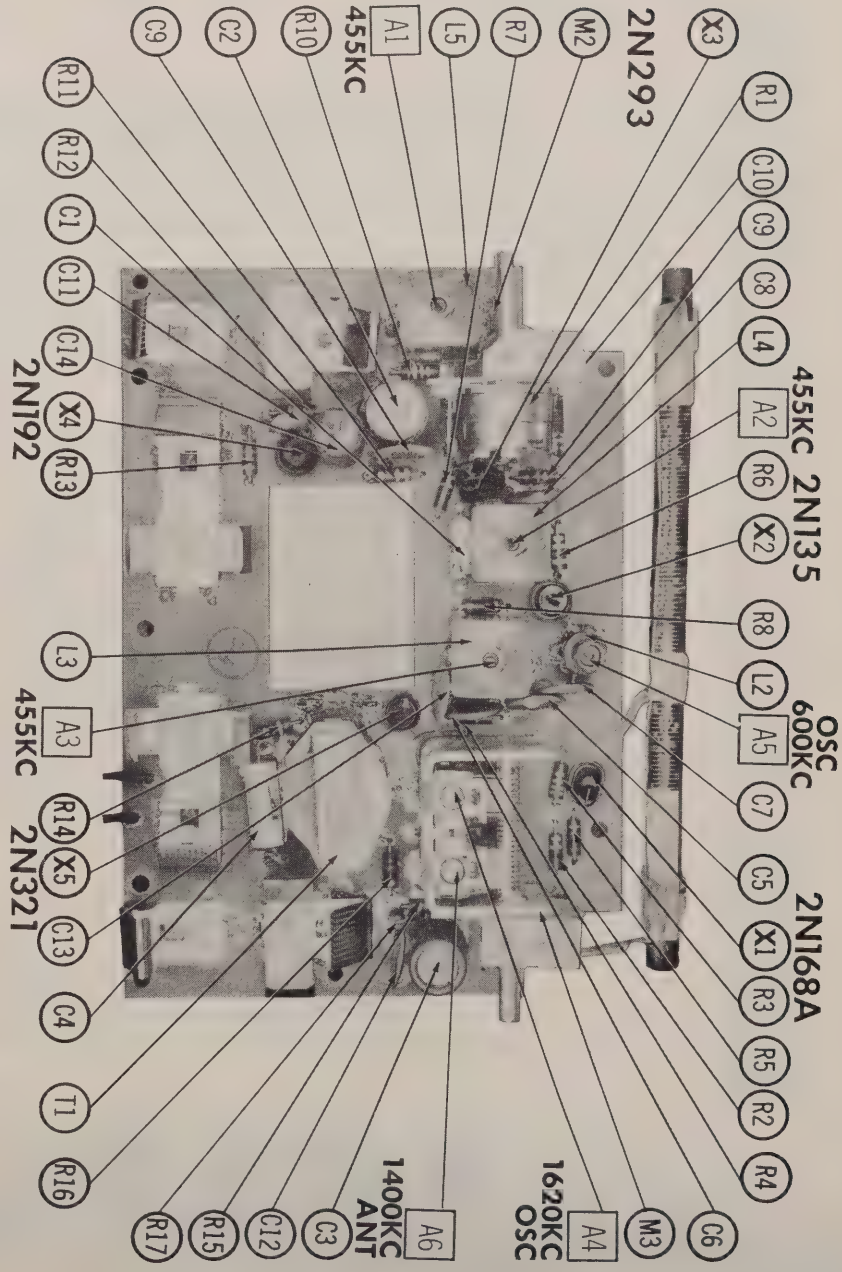
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knobs	RS-1069	Tuning
Knobs	RS-1071	Volume
Cabinet	RB-1060	Complete (Beige) Model P760A
Cabinet	RB-1061	Complete (Green) Model P761A
Grille	RS-1390	

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



WIRING DATA

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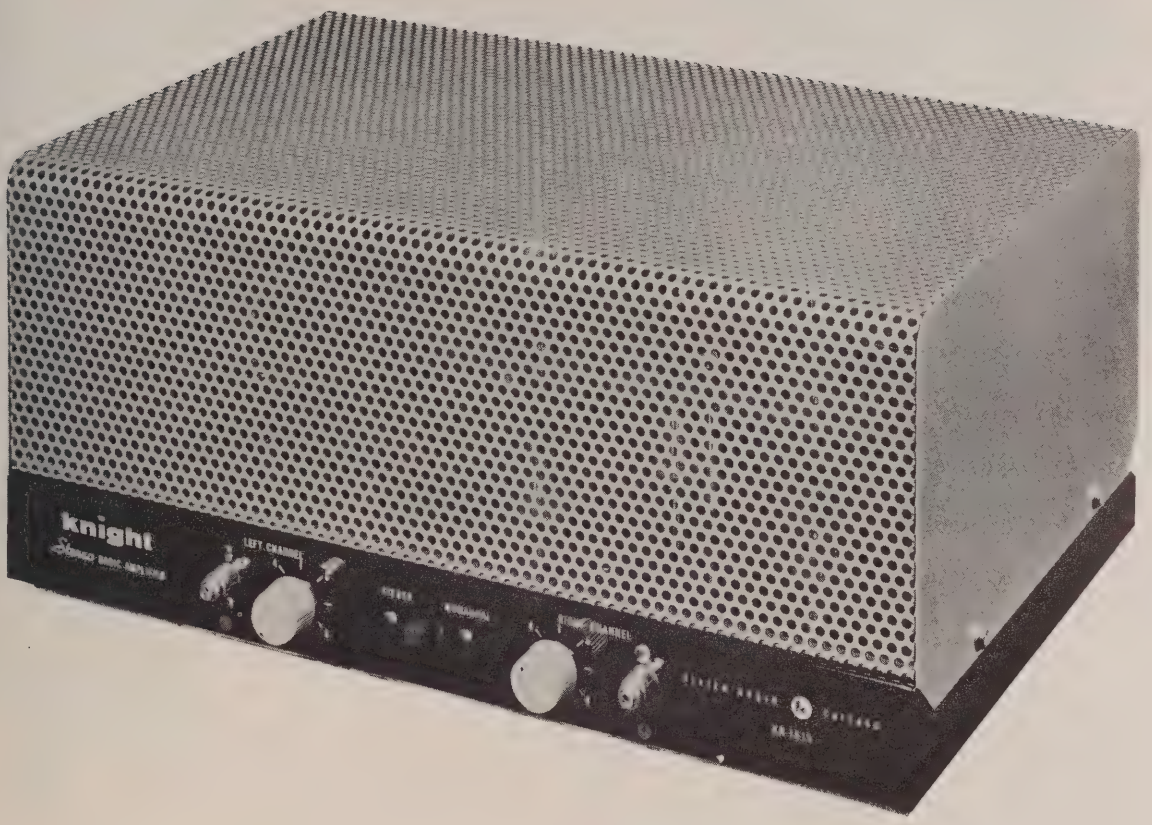
KNIGHT
MODEL KN-1515

KNIGHT
MODEL KN-1515



KNIGHT
MODEL KN-1515

TRADE NAME	Knight Model KN-1515
SUPPLIER	Allied Radio Corp., 100 N. Western Ave., Chicago 80, Illinois
TYPE SET	AC Operated 2 Channel 30 Watt Audio Amplifier
TUBES (Seven)	Type 6BH8 Right Channel AF Amp.-Phase Inv., (2)6BQ5/EL84 Right Channel Output, 6BH8 Left Channel AF Amp.-Phase Inv., (2) 6BQ5/E184 Left Channel Output, 5U4GB Rectifier
POWER SUPPLY	105-130 Volts AC-50/60 Cycles RATING 1.06 Amp. @ 117 Volts AC (110 Watts)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	Right Channel AF Amp. - Phase Inv.	6BH8
V2	Right Channel Output	6BQ5/ EL84
V3	Right Channel Output	6BQ5/ EL84
V4	Left Channel AF Amp. - Phase Inv.	6BH8

ITEM No.	USE	TYPE
V5	Left Channel Output	6BQ5/ EL84
V6	Left Channel Output	6BQ5/ EL84
V7	Rectifier	5U4GB

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Knight PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲40	450		AFH4-17	D0160	FP475.5	TMQ-17	Q-055	TVL-4771.3
B	■10	450	①						
C	▲10	450	①						
D	10	450	①						
C2	8	450		PRS450V8	BR845	TC71	TD-8-450	MT-4508	TVA-1704
C3	35	50		PRS150V30	BR505	TC47	TD-50-50	MT-0550	TVA-1308

① In some versions C1B is 30mfd, and C1C & C1D are not used

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Knight PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	47			NPO-DI 47	DTZ-47	C10Q47C		5TCC-Q47	NPO 10%
C5	47			NPO-DI 47	DTZ-47	C10Q47C		5TCC-Q47	NPO 10%
C6	47			NPO-DI 47	DTZ-47	C10Q47C		5TCC-Q47	NPO 10%
C7	47			NPO-DI 47	DTZ-47	C10Q47C		5TCC-Q47	NPO 10%
C8	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C9	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C10	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C11	.047	600		P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Knight PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K	½	RP-504B-H	B-60	A47-500K-Z	Q13-133	U48	Left Channel
B	Shaft			Not req.	KSS-3	Not req.	Not req.	
R2A	500K	½	RP-504B-H	B-60	A47-500K-Z	Q13-133	U48	Right Channel
B	Shaft			Not req.	Kss-3	Not req.	Not req.	

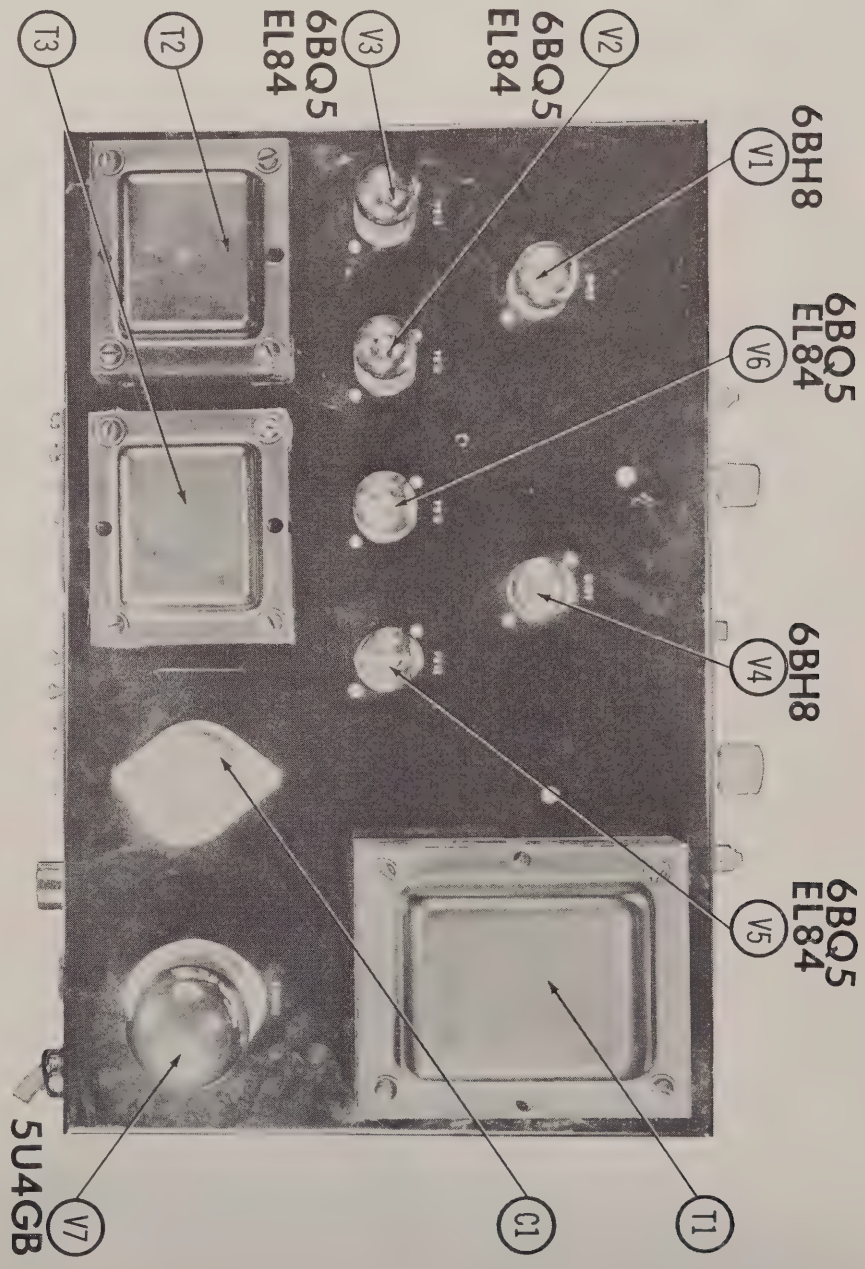
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Knight PART No.	NOTES
	OHMS	WATT		
R3	100K			
R4	220K			
R5	220K			
R6	22K			
R7	680Ω			
R8	15K	1		
R9	15K	1		
R10	100K			
R11	220K			
R12	220K			
R13	22K			
R14	680Ω			

ITEM No.	RATING		Knight PART No.	NOTES
	OHMS	WATT		
R15	15K	1		
R16	15K	1		
R17	100K			
R18	100K			
R19	100K			
R20	100K			
R21	30K 5%			
R22	30K 5%			
R23	10K	2		
R24	100Ω	2		
R25	22K			
R26	150Ω			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Knight PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @1.06A SEC. 3 6.3VCT @4A	580 VCT @.160A Tap @ 13V @.001A	5V @2.5A	LP-0272						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Knight PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4800Ω CT	32Ω Taps @ 16Ω, 8Ω, 4Ω	LO-0158							
T3	4800Ω CT	32Ω Taps @ 16Ω, 8Ω, 4Ω	LO-0158							

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	Knight PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.001A		1159	D-5410	10	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Knight PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	3A-125V-S/B			313003. (3AG-3A-125V-S/B)	341001	MDX3	HKP

MISCELLANEOUS

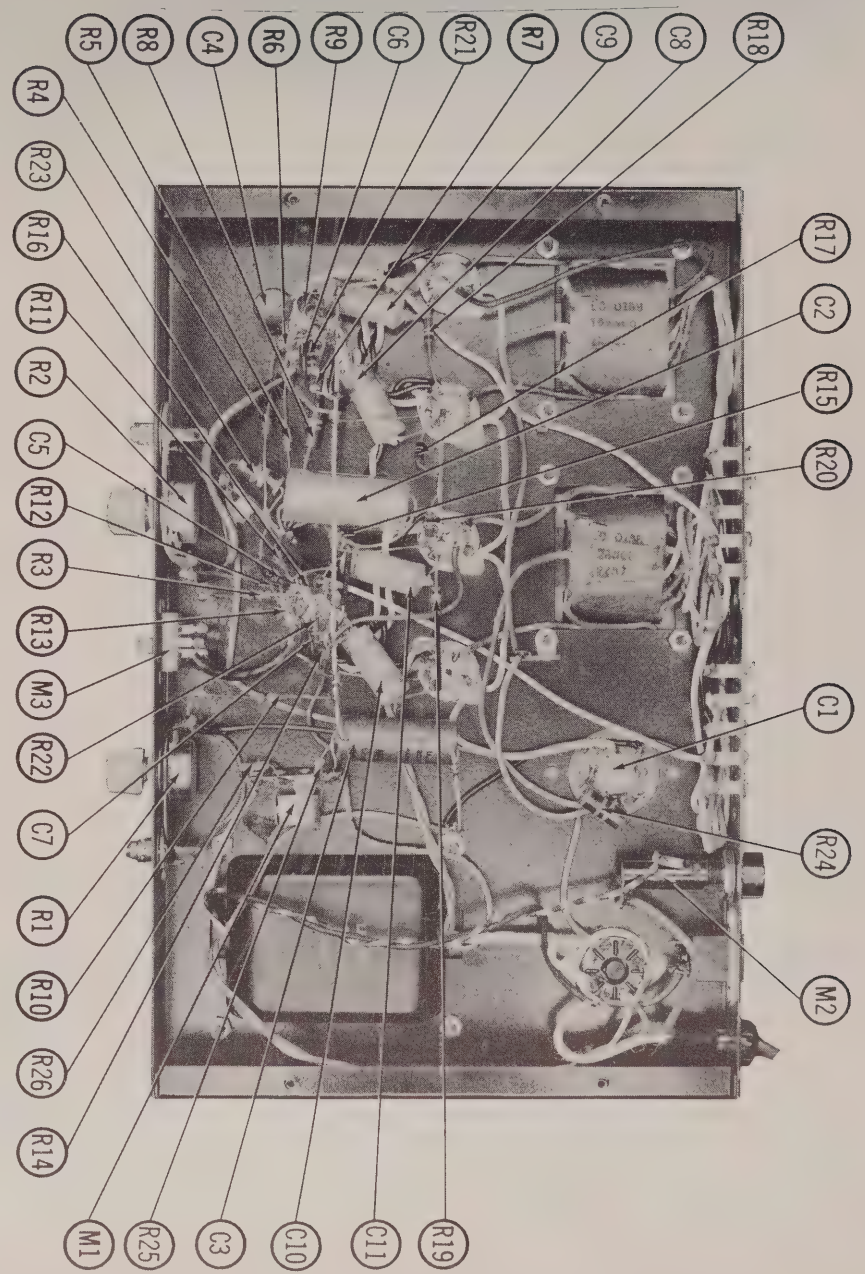
ITEM No.	PART NAME	Knight PART No.	NOTES
M3	Switch		Stereo-Monaural, SPDT, Slide Type

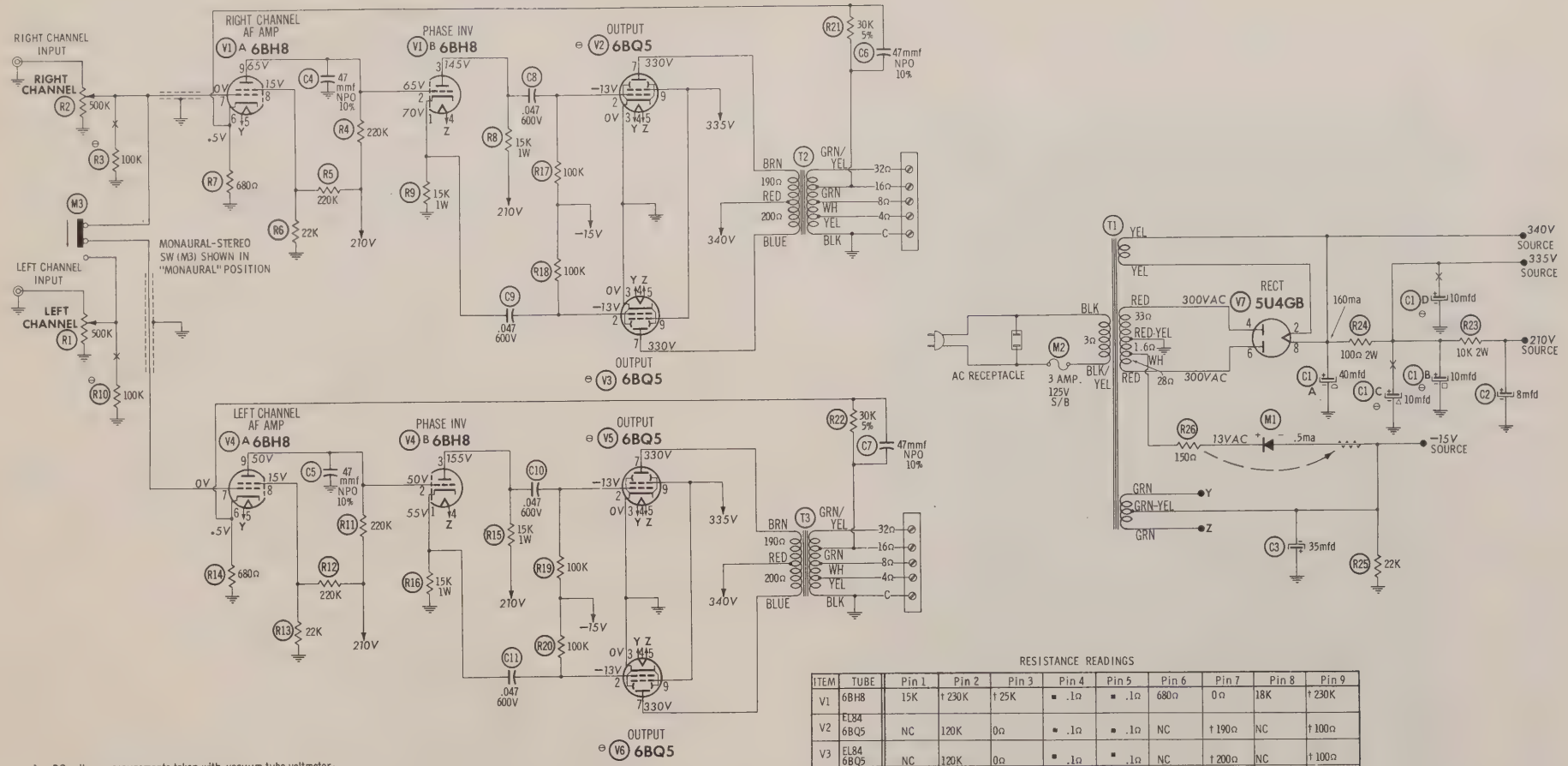
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BH8	15K	† 230K	† 25K	▪ .1Ω	▪ .1Ω	680Ω	0Ω	18K	† 230K
V2	EL84 6BQ5	NC	120K	0Ω	▪ .1Ω	▪ .1Ω	NC	† 190Ω	NC	† 100Ω
V3	EL84 6BQ5	NC	120K	0Ω	▪ .1Ω	▪ .1Ω	NC	† 200Ω	NC	† 100Ω
V4	6BH8	15K	† 230K	† 25K	▪ .1Ω	▪ .1Ω	680Ω	0Ω	18K	† 230K
V5	EL84 6BQ5	NC	120K	0Ω	▪ .1Ω	▪ .1Ω	NC	† 190Ω	NC	† 100Ω
V6	EL84 6BQ5	NC	120K	0Ω	▪ .1Ω	▪ .1Ω	NC	† 200Ω	NC	† 100Ω
V7	5U4GB	NC	¶	NC	33Ω	NC	29.6Ω	TP	¶	

THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 2 OF V7
▪ MEASURED FROM NEGATIVE TERMINAL OF M1
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT* Folder

with CIRCUITRACE*

MAGNAVOX CHASSIS
51-03AA, 51-03BA, 51-05AA, 51-08AA

MAGNAVOX CHASSIS
51-03AA, 51-03BA, 51-05AA, 51-08AA

MAGNAVOX CHASSIS
51-03AA, 51-03BA, 51-05AA, 51-08AA

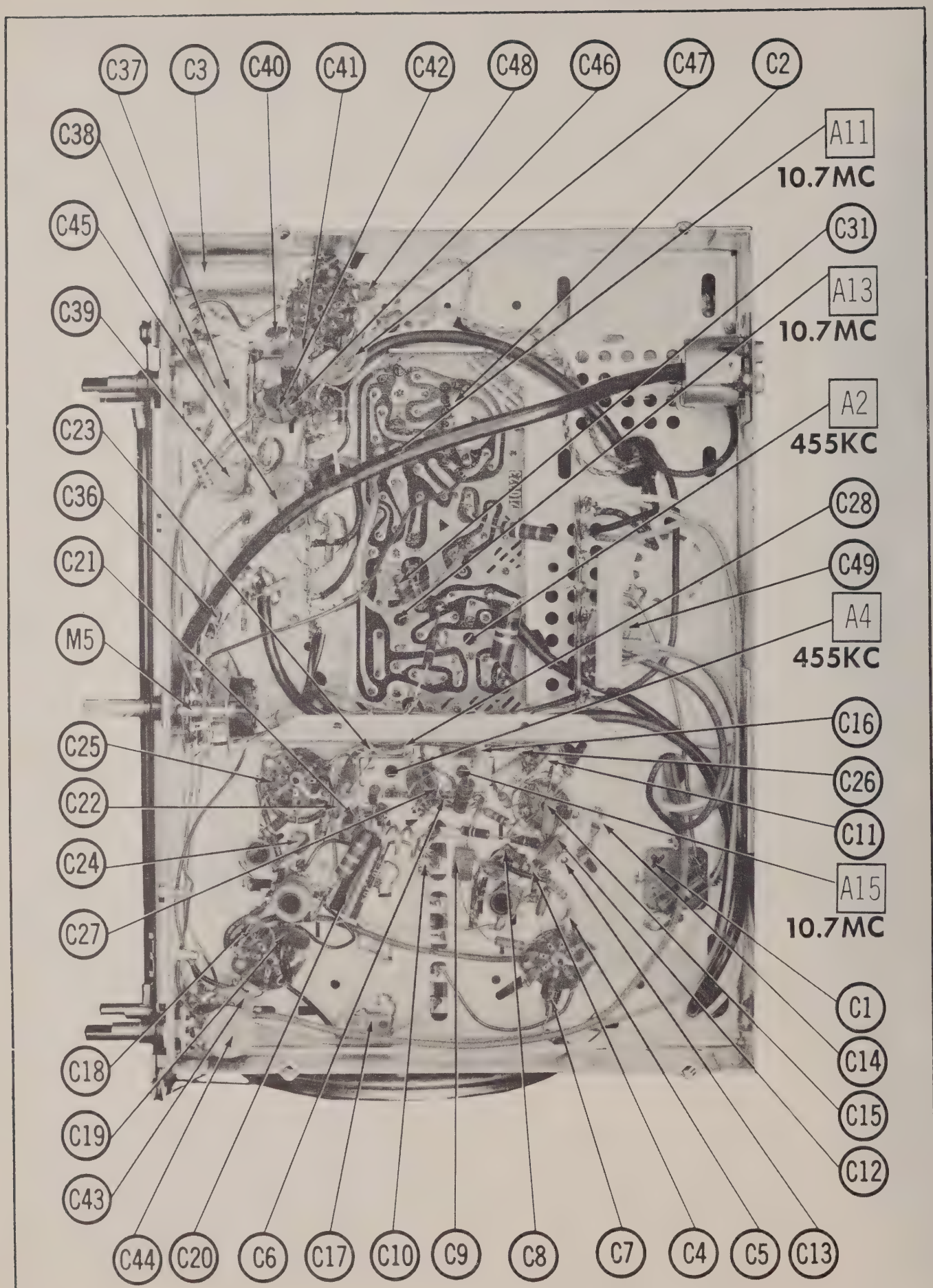
TRADE NAME	Magnavox Chassis 51-03AA, 51-03BA, 51-05AA, 51-08AA		
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana		
TYPE SET	Externally Powered FM-AM Tuner		
TUBES (Nine)	Types 6CY5 FM RF Amplifier, 6U8 FM Mixer-FM Osc., 6BZ6 AM RF Amp., 6BE6 AM Converter, 6BA6 1st FM AM IF Amp., 6BA6 2nd FM IF Amp., 6AL5 Ratio Detector, 6E5 Tuning Indicator, 12AX7 AF Amplifier - Cathode Follower		
POWER SUPPLY	Filament Supply Only	RATING	.23 Amp. @ 117 Volts AC (23 Watts)
TUNING RANGE - BROADCAST	540 - 1620KC	FREQ. MOD.	88 - 108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

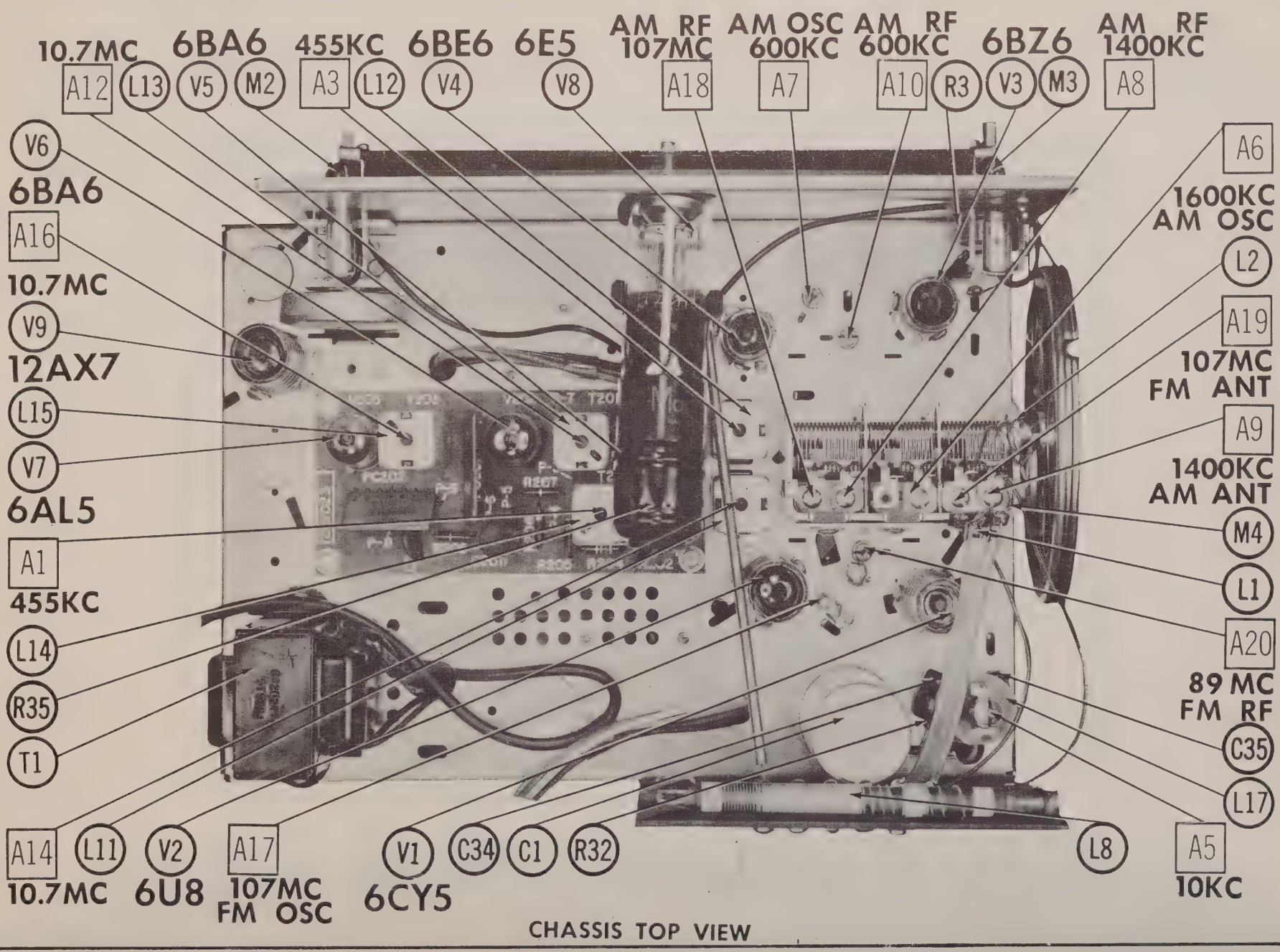
H679

SET 421 FOLDER 10



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CHASSIS TOP VIEW

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting. Check setting of dial pointer. Adjust if necessary.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of 6BE6 (V4). Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	455KC (10KC Mod.)	"	"	"	A5	Adjust for MINIMUM output.
3.	10mmf	High side to AM antenna terminal. Low side to chassis.	1600KC (400∿ Mod.)	"	1600KC	"	A6	Adjust for maximum output.
4.	"	"	600KC	"	600KC	"	A7	Adjust for maximum output while rocking tuning gang. Repeat steps 2 and 3.
5.	"	"	1400KC	"	Tune to 1400KC signal	"	A8, A9	Adjust for maximum output.
6.	"	"	600KC	"	Tune to 600KC signal	"	A10	Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	.01mfd	High side to pin 5 (plate) of 6CY5 (V1). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe thru 1meg to point (A). Common to chassis.	A11, A12, A13, A14, A15	Adjust for maximum deflection.
8.	"	"	"	"	"	DC probe thru 1meg to point (B). Common to chassis.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat steps 7 and 8.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
7.	.01mfd	High side to pin 5 (plate) of 6CY5 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. thru 1meg to point (A). Low side to chassis.	A11, A12, A13, A14, A15	Disconnect stabilizing capacitor C2. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
8.	"	"	"	"	"	Vert. Amp. thru 1meg to point (B). Low side to chassis.	A16	Reconnect stabilizing capacitor C2. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across FM antenna terminals with 120Ω in each side.	107MC (Unmod.)	FM	107MC	DC probe thru 1meg to point (A). Common to chassis.	A17, A18, A19	Adjust for maximum deflection.
10.	"	"	89MC	"	89MC	"	A20	Adjust for maximum deflection. Repeat steps 9 and 10.

FIG. 1

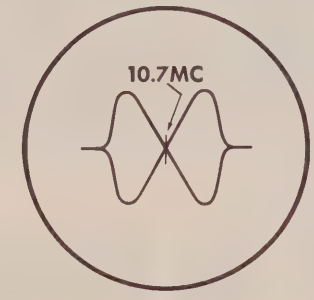
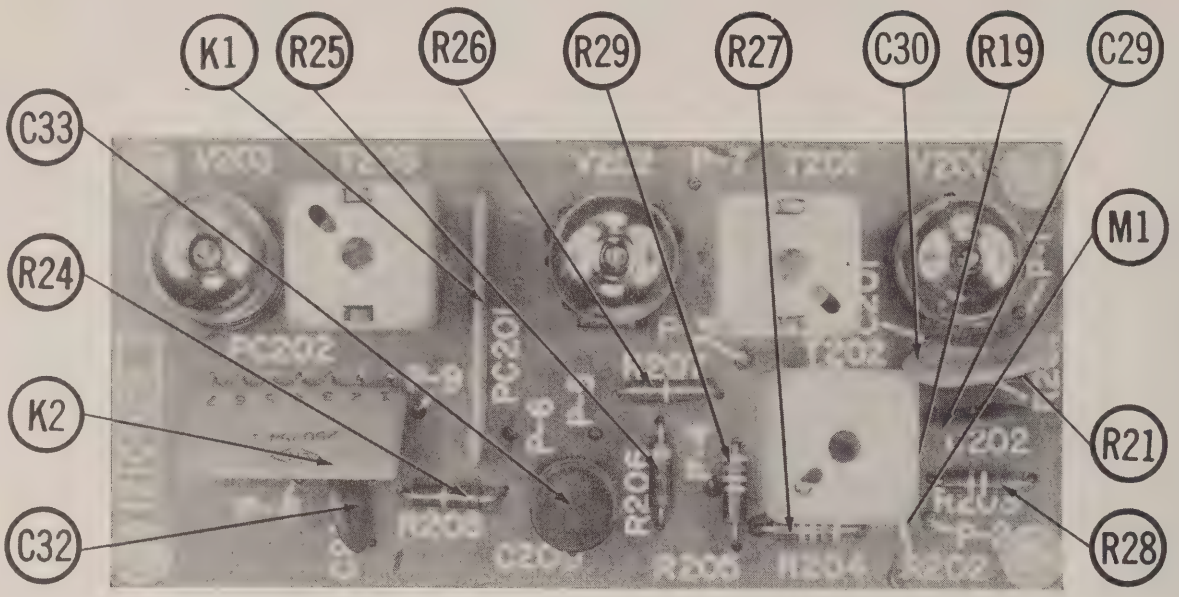
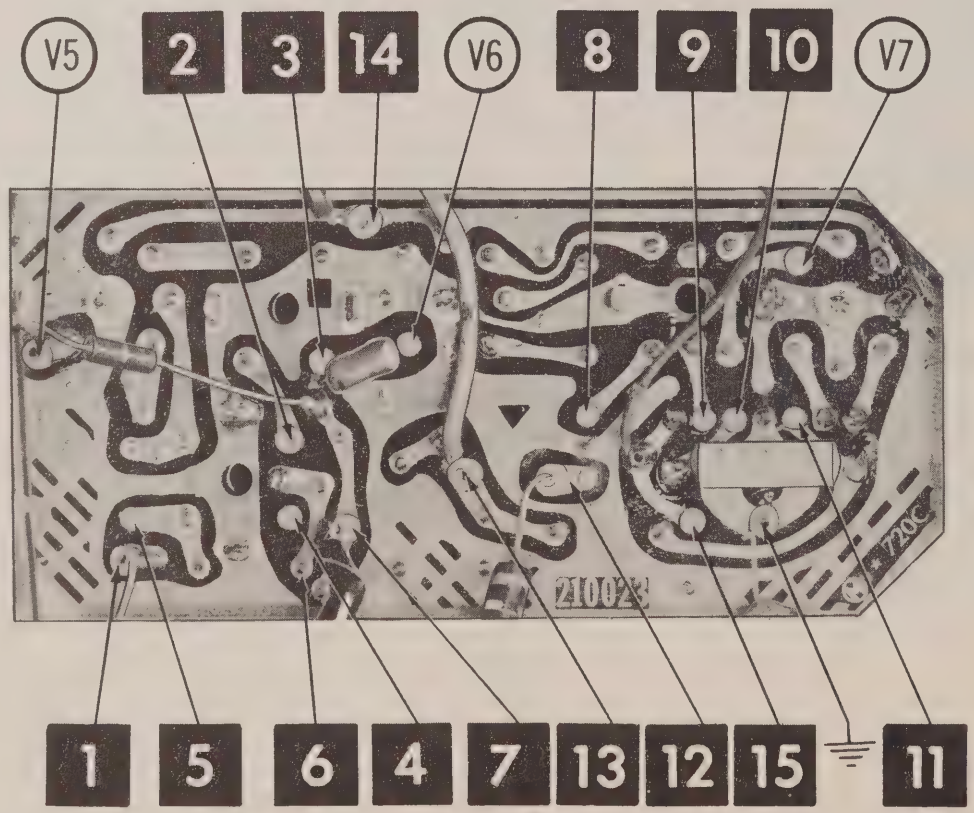


FIG. 2



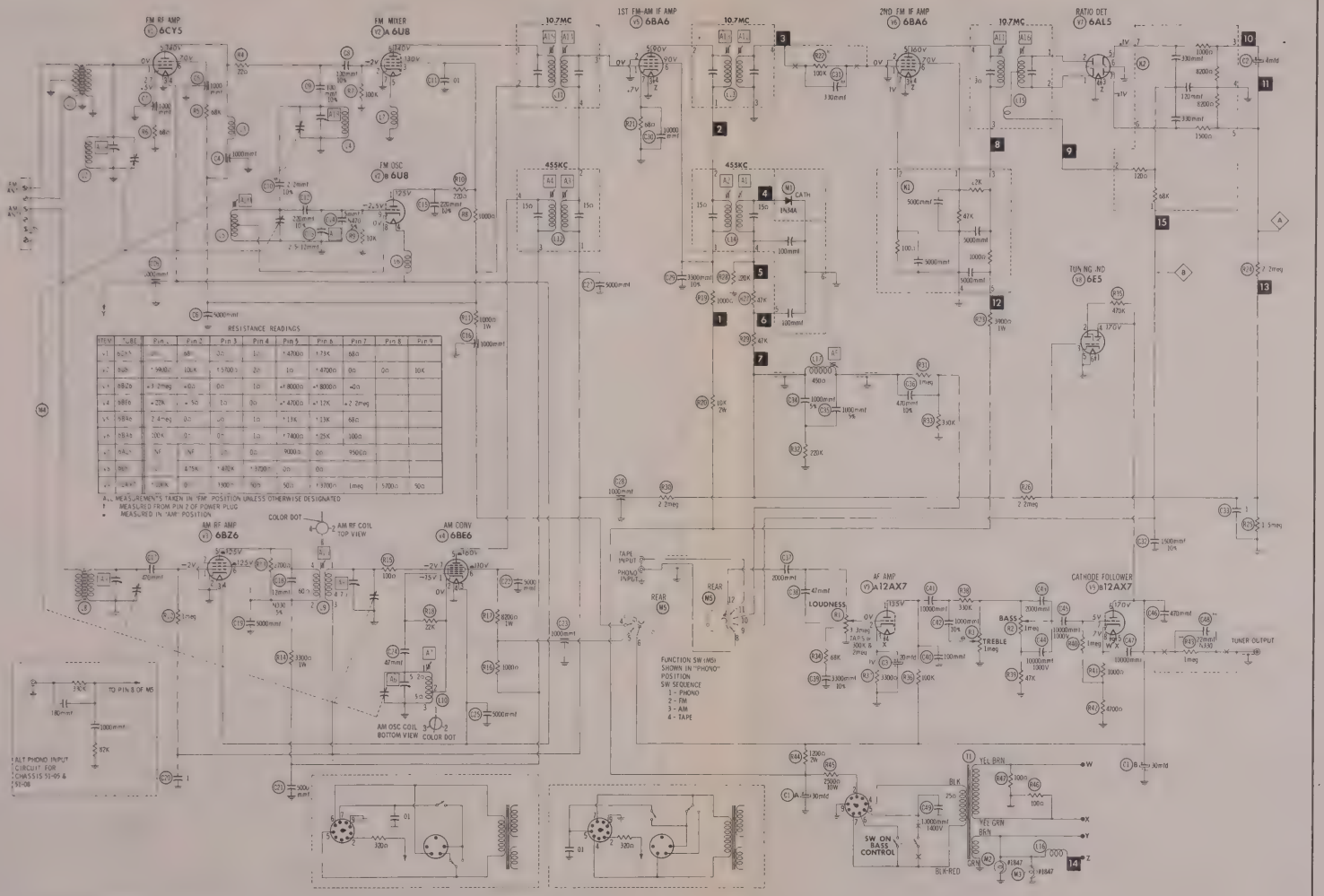
PRINTED BOARD TOP VIEW



A Howard W. Sams CIRCUITRACE* Photo
*TRADE MARK

PRINTED BOARD
BOTTOM VIEW

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
CIRCUITRACE®

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1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

421-10

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM RF Amplifier	6CY5	
V2	FM Mixer - FM Osc.	6U8	
V3	AM RF Amplifier	6BZ6	
V4	AM Converter	6BE6	
V5	1st FM-AM IF Amplifier	6BA6	
V6	2nd FM IF Amplifier	6BA6	
V7	Ratio Detector	6AL5	
V8	Tuning Indicator	6E5	
V9	AF Amplifier - Cathode Follower	12AX7	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲30	450	270021-58	AFH2-54	B0430	FP237	TMD-52	D-225	TVL-2759
B	▲30	450							TE-1303
C2	4	50	270559-9	PWE50005	NL5-50	TT50X5			
C3	20	25	270027-28	PRS50V20	BBR20-25	TT25X20	TD-25-25	MT-0220	TVA-1205

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	1000		250276-1	EF-001	MFT-1000			503C-D1	
C5	1000		250276-2	EF-001	MFT-1000			503C-D1	
C6	5000		250175-30	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C7	1000		250276-2	EF-001	MFT-1000			503C-D1	
C8	100		250187-53	1469-0001	DD-101	22R5T1	MCB235	MS-31	10%
C9	100		250187-53	1469-0001	DD-101	22R5T1	MCB235	MS-31	10%
C10	2.2		250221-118	NPO-S1 2.2	TCZ-2R2	CTA6V22C		5TCCB-V22	①
C11	.01	400	250211-7	P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C12	220		250187-57	1469-00022	MD-221	22R5T22		MS-322	10%
C13	2.5-12		250188-9						
C14	5		250088-138						N470 5%
C15	220		250187-57	1469-00022	MD-221	22R5T22		MS-322	10%
C16	1000		250276-1	EF-001	MFT-1000			503C-D1	
C17	470		250159-102	1468-00047	DD-471	5W5T47		1FM-347	
C18	12		250088-179						N330 5%

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C19	5000		250175-30	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C20	.1	100	250261-125	P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C21	5000		250175-30	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C22	5000		250175-30	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C23	1000		250276-1	EF-001	MFT-1000			503C-D1	
C24	47		250218-17	BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C25	5000		250175-30	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C26	1000		250276-1	EF-001	MFT-1000			503C-D1	
C27	5000		250175-30	BPD-005	DD-502	BYA10D5	DC525	5HK-D5	
C28	1000		250276-1	EF-001	MFT-1000			503C-D1	
C29	3300		250234-154						10%
C30	10000		250234-66	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C31	330			SI 330	D6-331	LT6T33	UC-5333	5GA-T33	②
C32	1500		250234-146						10%
C33	.1	200	250240-13	P288N-1	DF-103	CUB2P1	GEM-201	2TM-P1	
C34	1000		250228-354	1469-001		1R5D1	MCE251	MS-21	5%
C35	1000		250228-354	1469-001		1R5D1	MCE251	MS-21	5%
C36	470		250218-6	1469-00047	MD-471				10%
C37	2000		250218-20	BPD-002	DD-202	BYA10D2	DC522	5HK-D2	
C38	47		250218-17	BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C39	3300		250175-28						10%
C40	100		250187-53	BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C41	10000		250218-19	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C42	1000		250218-18						10%
C43	2000		250218-20	BPD-002	DD-202	BYA10D2	DC522	5HK-D2	
C44	10000	1000	250218-19	DAC-27	DD-103	BYA10S1		5HK-S1	
C45	10000	1000	250218-19	DAC-27	DD-103	BYA10S1		5HK-S1	
C46	470		250218-6	BPD-00047	DD-471	BYA10T47	UC-5347	5GA-T47	
C47	10000		250218-19	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C48	22		250218-1						N330 ③
C49	10000	1400	250219-2	DAC-27	DD16-103	HVE16S1		20HKB-S1	

① Some versions may use 3.3mmf in this application.
② Not used in some versions.
③ Used in Chassis 51-03 only.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	3.3meg	½	220131-13				UDT-303	Loudness, Tap ② 300K &
R2A	1meg	½	220073-24	B-70	A47-1meg-Z		U53	Bass 2meg
B	Shaft			Not Req.	FS-3		Not Req.	
C	Switch			KB-3 or KR-3*	SWE-21		US-28	
R3	1meg	½	220072-37	B-68		Q17-137	U52	Treble Note 1

* Use KR with CRL "Red Label" Controls and KB with "Blue Label" Controls.
Note 1. Part #220072-36 may be used in some versions.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	MAGNAVOX PART No.	NOTES
R4	22Ω		230104-42	
R5	68K		230104-84	
R6	68Ω		230104-48	
R7	100K		230104-86	
R8	1000Ω		230104-62	
R9	10K		230104-74	
R10	220Ω		230104-54	
R11	1000Ω	1	230105-62	
R12	1meg		230104-98	
R13	2700Ω		230104-67	
R14	3300Ω	1	230105-68	
R15	100Ω		230104-50	
R16	1000Ω		230104-62	
R17	8200Ω	1	230105-73	
R18	22K		230104-78	
R19	1000Ω		230104-62	
R20	10K	2	230104-1074	
R21	68Ω		230104-48	
R22	100K		230104-86	Note 1
R23	3900Ω	1	230105-69	
R24	2.2meg		230104-102	
R25	1.5meg		230104-100	
R26	2.2meg		230104-102	
R27	47K		230104-82	
R28	220K		230104-90	
R29	47K		230104-82	
R30	2.2meg		230104-102	
R31	1meg		230104-98	
R32	220K		230104-90	
R33	330K		230104-92	
R34	68K		230104-84	
R35	470K		230104-94	
R36	100K		230104-86	
R37	3300Ω		230104-68	
R38	330K		230104-92	
R39	47K		230104-82	
R40	1meg		230104-98	
R41	1000Ω		230104-62	
R42	4700Ω		230104-70	
R43	1meg		230104-98	Note 2
R44	1200Ω	2	230106-1063	
R45	2500Ω	10	240071-39	
R46	100Ω		230104-50	
R47	100Ω		230104-50	

Note 1. Not used in some versions.
Note 2. Used in Chassis 51-03 only.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA MAGNAVOX PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.	360491-4					
L2	FM Ant. Coil	360750-1					
L3	RF Choke	360522-9	19-1002	BC-563	4606		2 Microhenries
L4	FM RF Coil	360751-1					
L5	FM Osc. Coil	360628-1					
L6	Fil. Choke	360522-9	19-1002	BC-563	4606		2 Microhenries
L7	Fil. Choke	360522-9	19-1002	BC-563	4606		2 Microhenries
L8	Loop Stick	360746-1					
L9	AM RF Trans.	360753-1					
L10	AM Osc. Coil	360752-1	14-1055		70-OSC *		* Disregard Primary
L11	1st FM IF	360626-1	16-3487	FM-254	1463		
L12	1st AM IF	360611-1	16-6758	BC-352	12-C1	RF-1	
L13	2nd FM IF	360747-1	16-3490		1463-PC		
L14	2nd AM IF	360749-1					
L15	Ratio Det.	360748-1			1465-PC		
L16	Fil. Choke	360522-9	19-1002	BC-563	4606		2 Microhenries
L17	10KC Filter	360621-1					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .23A	6.3V @ .57A	6.3V @ 2.6A	320277-2						

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MAGNAVOX PART No.	REPLACEMENT DATA
K1	2nd IF Amp. B+ Net.	5000mmf, 5000mmf, 5000mmf, 5000mmf, 100Ω, 1000Ω, 22K, 47K	250255-1	
K2	Ratio Detector Plate	120mmf, 330mmf, 330mmf, 120Ω, 1000Ω, 1500Ω, 8200Ω, 8200Ω, 68K	250254-1	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA MAGNAVOX PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M1	1N34A	530049-1	1N34A	1N38A	AM Detector (Pigtail)

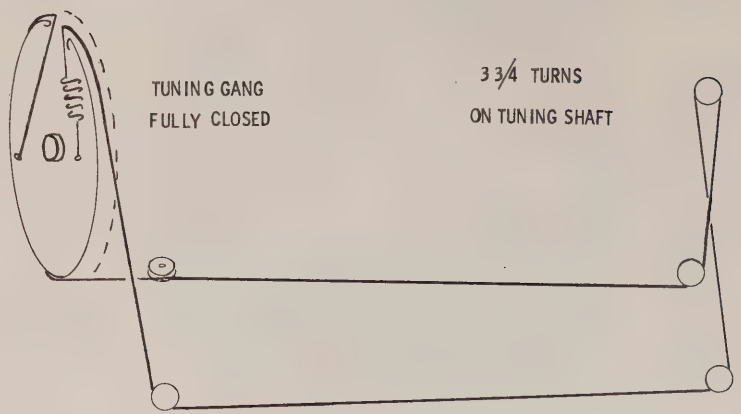
MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M2	Lamp	180161-17	#1847
M3	Lamp	180161-17	#1847
M4	Tuning Cap.	260147-1	6 Gang (AM Sections: Ant. 28-322mmf, RF 15-280mmf, Osc. 22-151mmf)
M5	Switch	160284-4	Function, Chassis 51-03BA
	Switch	160284-1	Function, Chassis 51-03, 51-05, 51-08
	Printed Board	210023	
	Dial Pointer	102448-2	
	Dial Scale	150533-1	Chassis 51-03
	Dial Scale	150545-1	Chassis 51-05
	Dial Scale	150551-1	Chassis 51-08

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

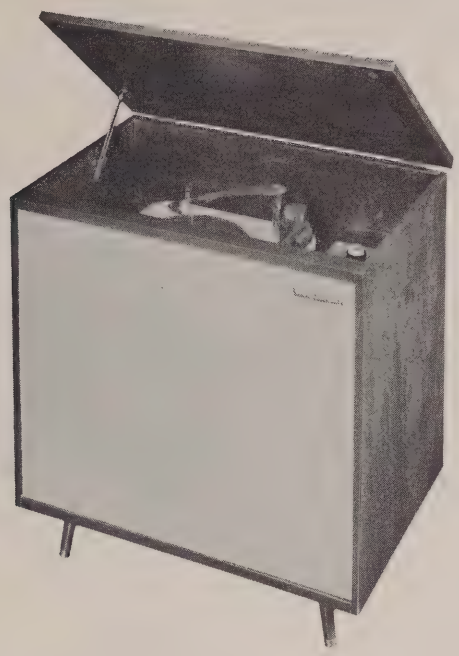


DIAL CORD STRINGING

PHOTOFACT* Folder

MUNTZ MODEL 804

MUNTZ MODEL 804



TRADE NAME	Muntz Model 804
MANUFACTURER	Muntz TV Inc., 1000 Grey Ave., Evanston, Ill.
TYPE SET	AC Operated AM Receiver with 4 Speed Automatic Record Changer
TUBES (Six)	Types 12BEG Converter, 12BAG IF Amplifier, 12AV6 Det.-AVC-AF Amp., 12AV6 Phase Inverter, (2) 35C5 Output
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .36 Amp. @117 Volts AC (31 Watts)
TUNING RANGE—BROADCAST	535 - 1620KC

FOR SERVICE INFORMATION ON RECORD CHANGER PART # PH-0018 - SEE SIMILAR WEBCOR 152 - PHOTOFACT SET 375 FOLDER 17 OR RECORD CHANGER MANUAL RC-10

MUNTZ MODEL 804

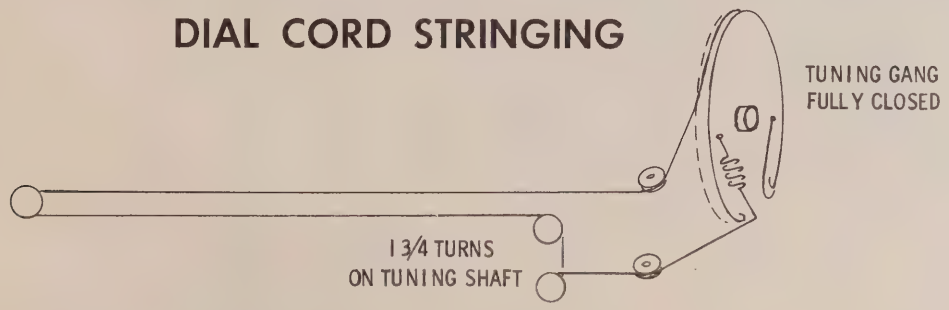
ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation fransformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01 MFD	High side to Pin 7 (Grid) of 12BE6 (V1) Low side to B-	455KC	Tuning Gang Fully Open	Across Voice Coil	A1, A2, A3, A4	Adjust For maximum output
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune For 1400KC Signal	"	A6	"

DIAL CORD STRINGING



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H631

SET 421 FOLDER 11

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	
V4	Phase Inverter	12AV6	
V5	Output	35C5	
V6	Output	35C5	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MUNTZ PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	CE8001	PRS150V80/ 4020	BBRT84215	TCT 3117	TDLT-7	FMT-339	TVA-3455
B	20	150							
C	50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	MUNTZ PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.047	400	CP-0068	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C3	.047	400	CP-0068	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C4	.08	200	CP-0097						
C5	.022	200	CPM-0108	P288N-022	DD-203	CUB4S22	GEM-4122	2TM-S22	
C6	.0047	600	CPM-0113				GEM-16247		10%
C7	270		CC-0094	BPD-00027	DD-271	L10T27	UC-5327	5GA-T27	
C8	3300		CC-0168	BPD-0033	DD-332	BYA10D33	UC-5233	5GA-D33	
C9	.022	600	CP-0053	P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C10	.022	200	CPM-0108	P288N-022	DD-203	CUB4S22	GEM-4122	2TM-S22	
C11	.022	600	CP-0053	P688N-022	DD-203	CUB6S22	GEM-6122	6TM-S22	
C12	.0022	600	CPM-0100				GEM-16222		10%
C13	2.0	50	CP-0098						
C14	.047	600	CP-0064	P688N-047	DF-503	CUB6S47	GEM-6147	6TM-S47	
C15	.047	400	CP-0068	P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MUNTZ PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1 meg	1/2	VC-8001	F1-52		QJ-918R	UE-3834S	Tone
B	500K			R2-44				Volume, Tap ⓐ 100K
C	Switch			KB-1 or KR-1*				

* Use KR with CRL "red label" controls and KB with "blue label" controls.

■ "Concentrikit" Equivalent: K-6 Kit, Base Elements and Shafts, B13-137, P17-102 (Panel) B13-133X, R1-118 (Rear) 76-1 Switch
Not available as a Factory Assembled control

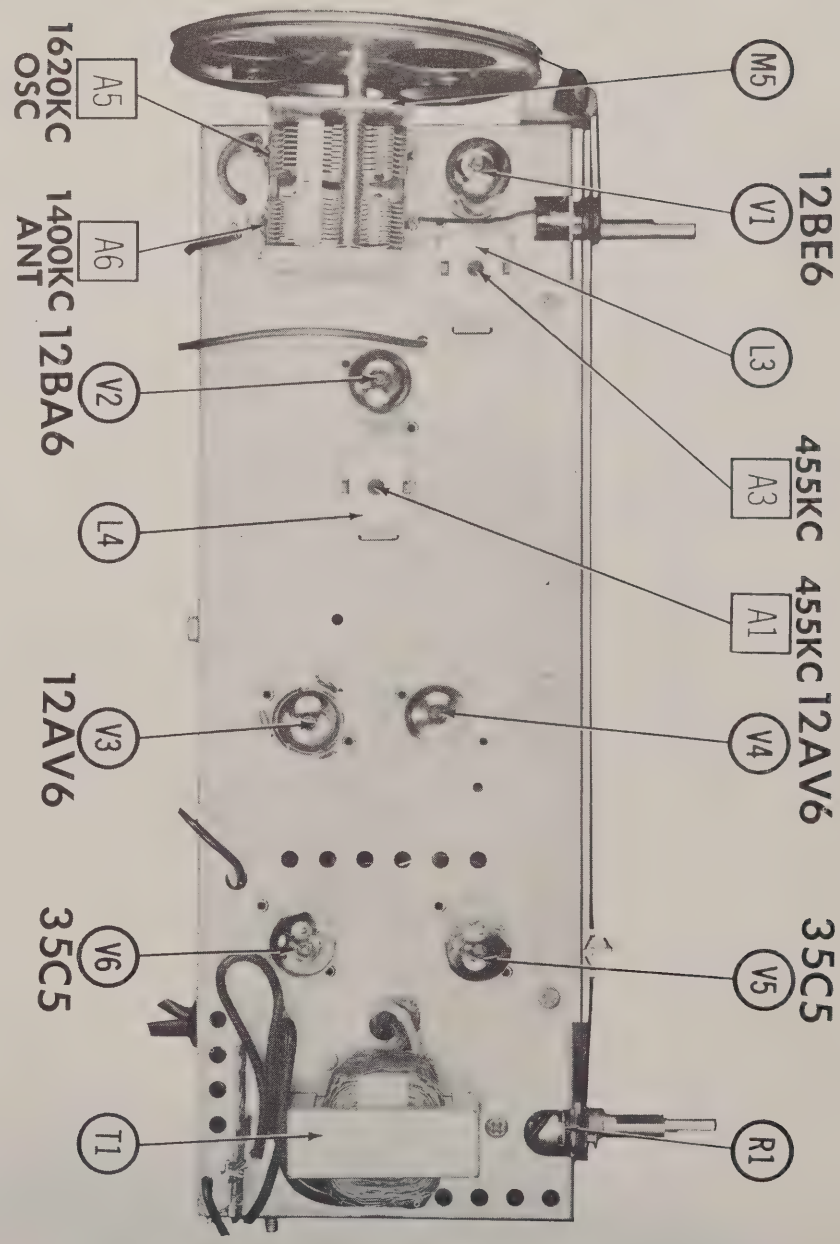
■■ "STA-LOC" Equivalent: FA16A, OF1000, RU55T124, IS1312, US-41

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MUNTZ PART No.	NOTES
	OHMS	WATT		
C2	22K		RC-2208-18	
C3	1 meg		RC-1004-18	
C4	180Ω		RC-180-18	
C5	1 meg		RC-1004-18	
C6	68K		RC-6802-18	
C7	5.6 meg		RC-5604-18	
C8	5.6 meg		RC-5604-18	
C9	270K		RC-2703-18	
C10	270K		RC-2703-18	
C11	470K		RC-4703-18	
C12	12K		RC-1202-18	
C13	470K		RC-4703-18	
C14	100Ω	1	RC-100-18	
C15	820Ω		RC-820-18	
C16	820Ω		RC-820-18	
C17	22Ω	2	RC-022-12	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MUNTZ PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Stick	AN-0023					
L2	Osc. Coil	LO-8001	14-1073	BC-393	69-OSC*		* Drill mtg. hole
L3	Input IF	LI-8001	16-6758	BC-352	12-C1	RF-1	
L4	Output IF	LI-8001	16-6758	BC-353	12-C2	RF-2	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	MUNTZ PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	8300Ω CT	6-8Ω	TO-8001	Z1404	A-2901	AU-600	A-3852	24S56	S-55z	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MUNTZ PART No.	QUAM PART No.	
SP1	8"	PM	6-8Ω	SK-0023-3	8A21Z6.8	
SP2	3½"	PM	3-4Ω	SK-0031	3A07	
SP3	3½"	PM	3-4Ω	SK-0031	3A07	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MUNTZ PART No.	REPLACEMENT DATA	
K1	Diode RF Filter	50 mmf, 50 mmf, 47K	CC-8001	Aerovox	PA-99
				Centralab	PC-52
				Cornell-Dubilier	111TM3
				Sprague	D-3

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	MUNTZ PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.094A	SR-8001	1235AH	RS100A	100 M150①	① Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	MUNTZ PART No.	ASTATIC PART No.		JENSEN PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2		81-TB				

PHONO NEEDLE

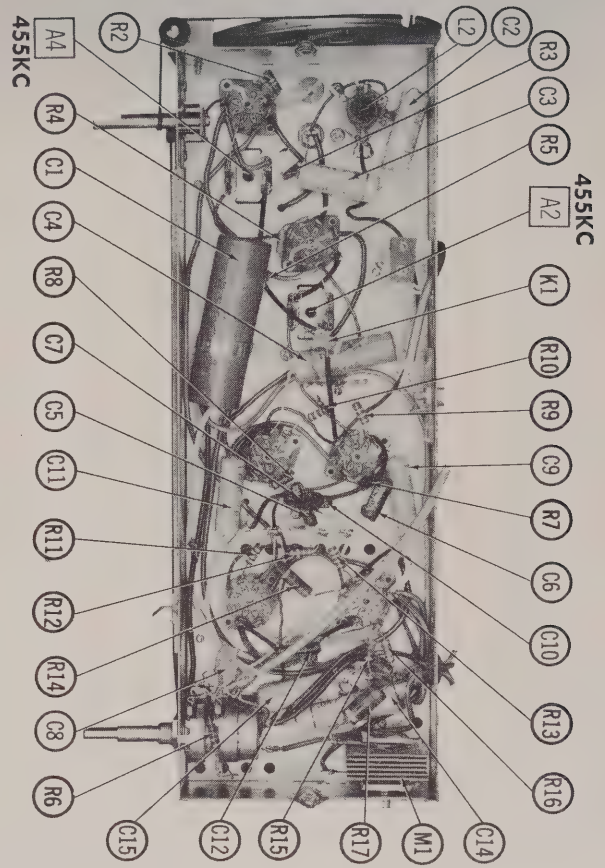
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	MUNTZ PART No.	JENSEN PART No.	WALCO PART No.	
M3				

MISCELLANEOUS

ITEM No.	PART NAME	MUNTZ PART No.	NOTES
M4	Lamp	LS-8001	110 Volt, 7 Watt
M5	Tuning Cap.	CT-8001	2 Gang (Ant. 24-279mmf Osc. 17-120mmf)
M6	Switch	SW-8001	Radio-Phono (DPDT, Slide Type)

CHASSIS—BOTTOM VIEW



CABINETS & CABINET PARTS

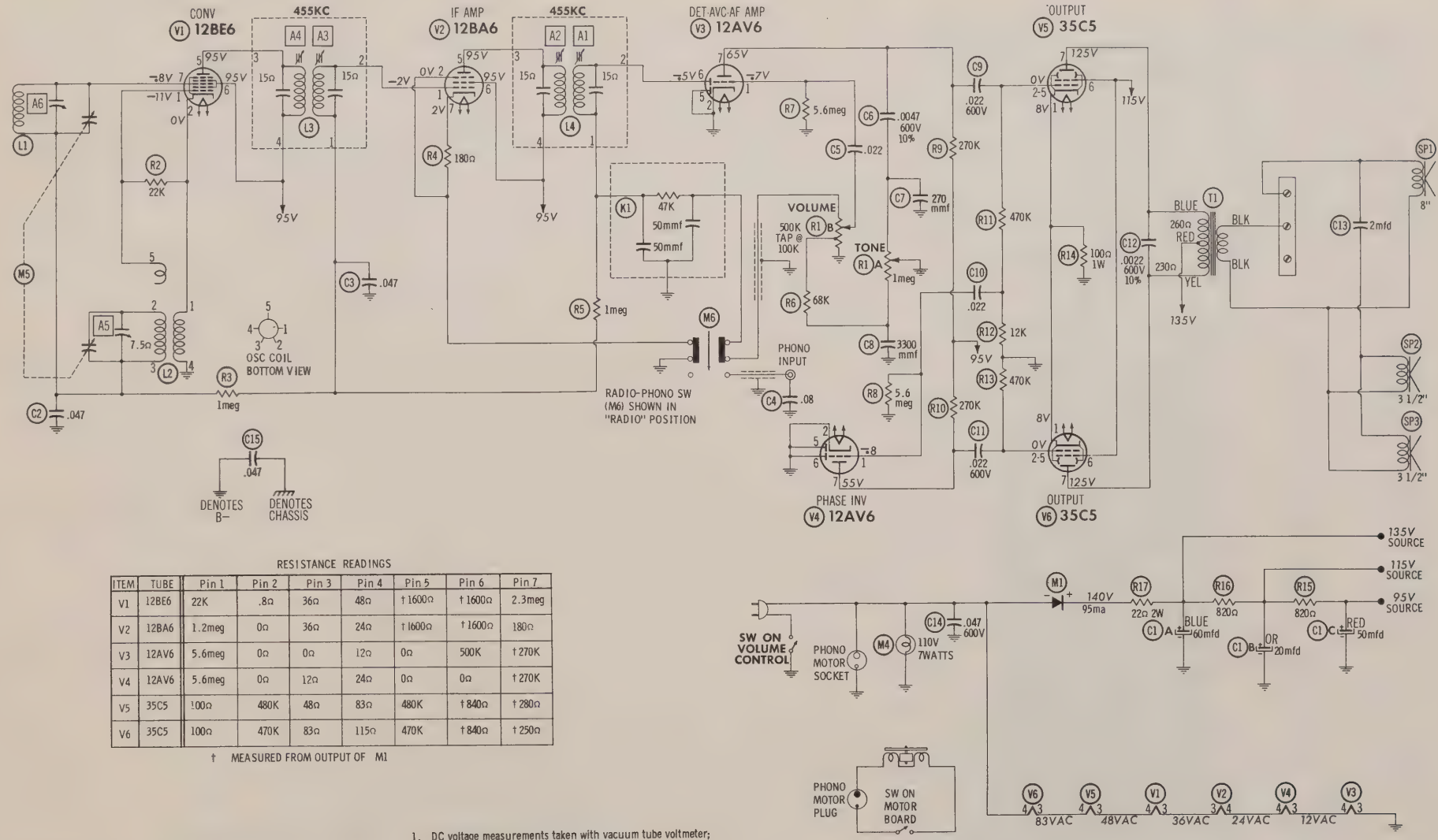
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	KB-8002	Tuning
Knob	KB-8003	On-Off-Volume
Knob	KB-8001	Tone
Cabinet	CW-0088	Mahogany
Cabinet	CW-0088-2	Blond
Pointer	PR-8005	Dial
Dial Glass	DG-8001	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

FOLDER 11
MUNTZ MODEL 804



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.8Ω	36Ω	48Ω	†1600Ω	†1600Ω	2.3meg
V2	12BA6	1.2meg	0Ω	36Ω	24Ω	†1600Ω	†1600Ω	180Ω
V3	12AV6	5.6meg	0Ω	0Ω	12Ω	0Ω	500K	†270K
V4	12AV6	5.6meg	0Ω	12Ω	24Ω	0Ω	0Ω	†270K
V5	35C5	100Ω	480K	48Ω	83Ω	480K	†840Ω	†280Ω
V6	35C5	100Ω	470K	83Ω	115Ω	470K	†840Ω	†250Ω

† MEASURED FROM OUTPUT OF M1

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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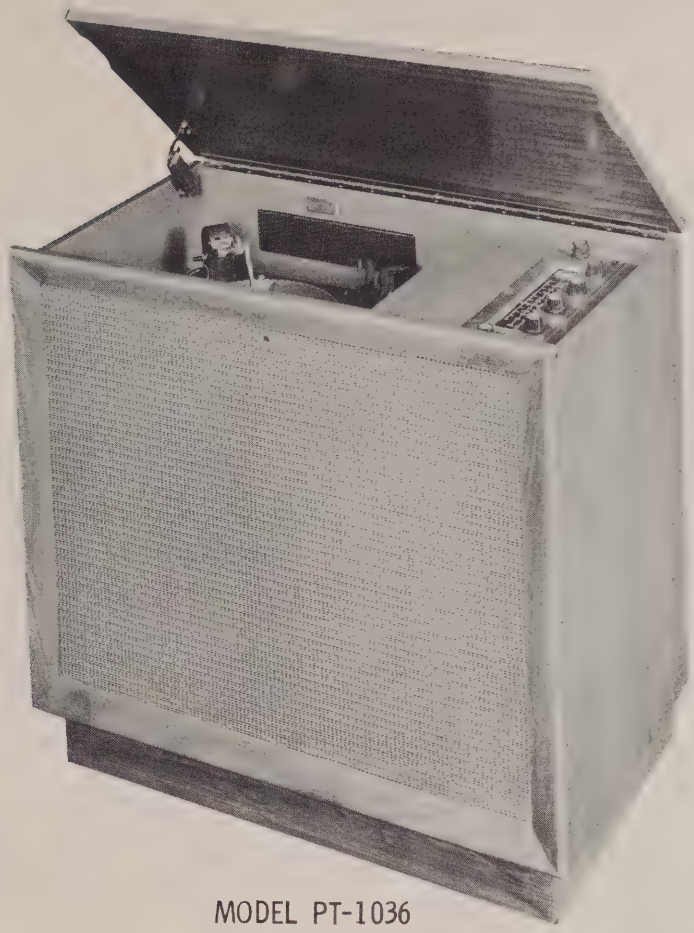
PHOTOFACT* Folder

PILOT MODELS HF-30, PT-1036

PILOT MODELS
HF-30, PT-1036



MODEL PT-1036

PILOT MODELS
HF-30, PT-1036

TRADE NAME	Pilot MODELS HF-30, PT-1036	
MANUFACTURER	Pilot Radio Corp., 37-06 36th Street, Long Island City 1, N.Y.	
TYPE SET	AC Operated FM-AM Receiver With 4 Speed Automatic Record Changer	
TUBES	Fourteen	
POWER SUPPLY	105-120 Volts AC-60 Cycles	RATING .97 Amp. @ 117 Volts AC (100 Watts) FM
TUNING RANGE-BROADCAST	535-1720KC	FREQ. MOD. 88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #108-31 — SEE GARRARD RC-88 — PHOTOFACT SET 338 FOLDER 5 OR RECORD CHANGER MANUAL CM-9.

INDICATOR ZERO SET (R4)

1. Turn "Function" switch to FM.
2. Remove 6AL5 (V6).
3. Allow receiver to warm up.
4. Adjust the Indicator Zero Set so that the shadow gap edges of the tuning indicator (V7) are parallel.
5. Replace the 6AL5 (V6).

Readjustment of R4 may be necessary if V7 is replaced.

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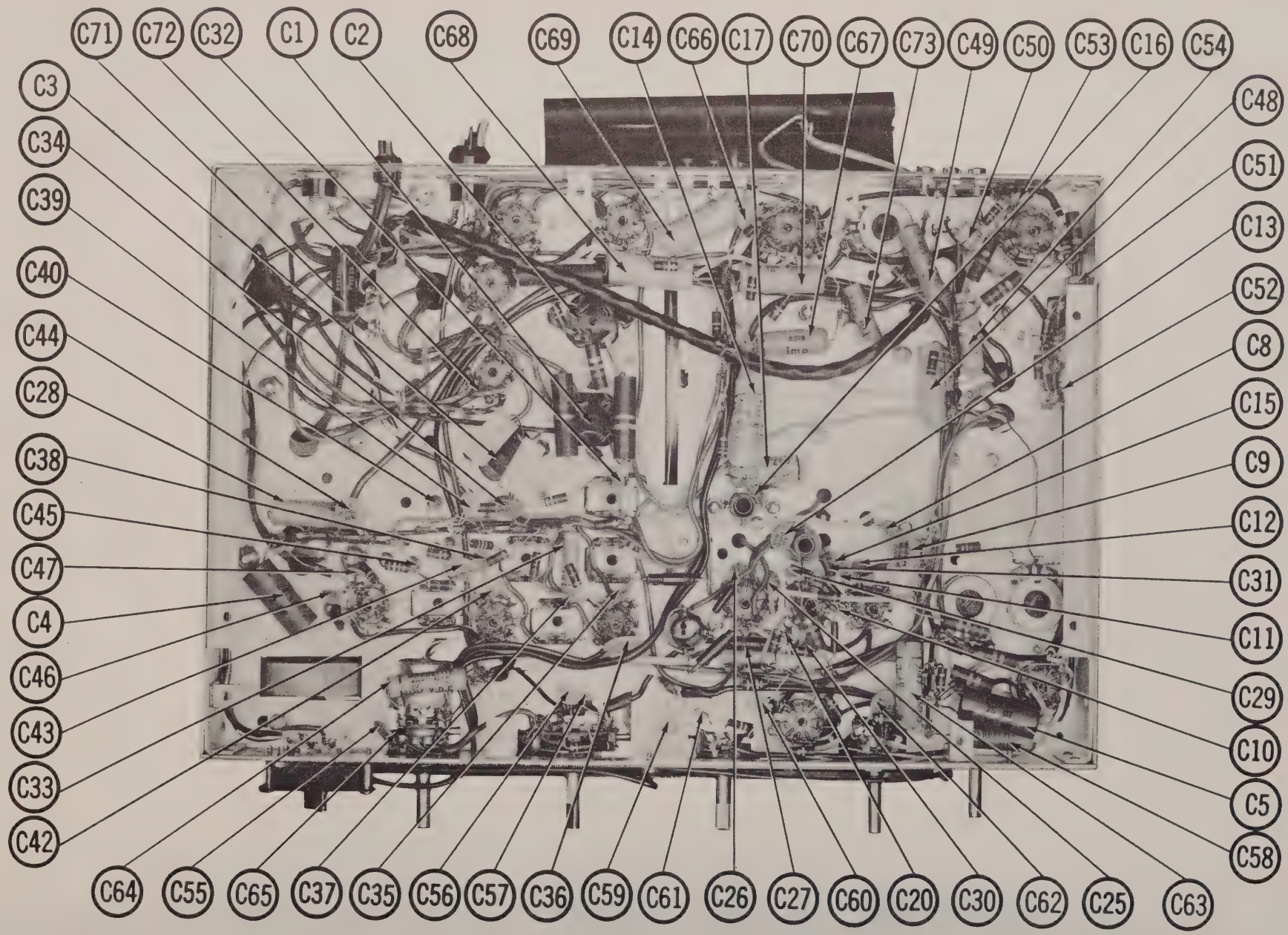
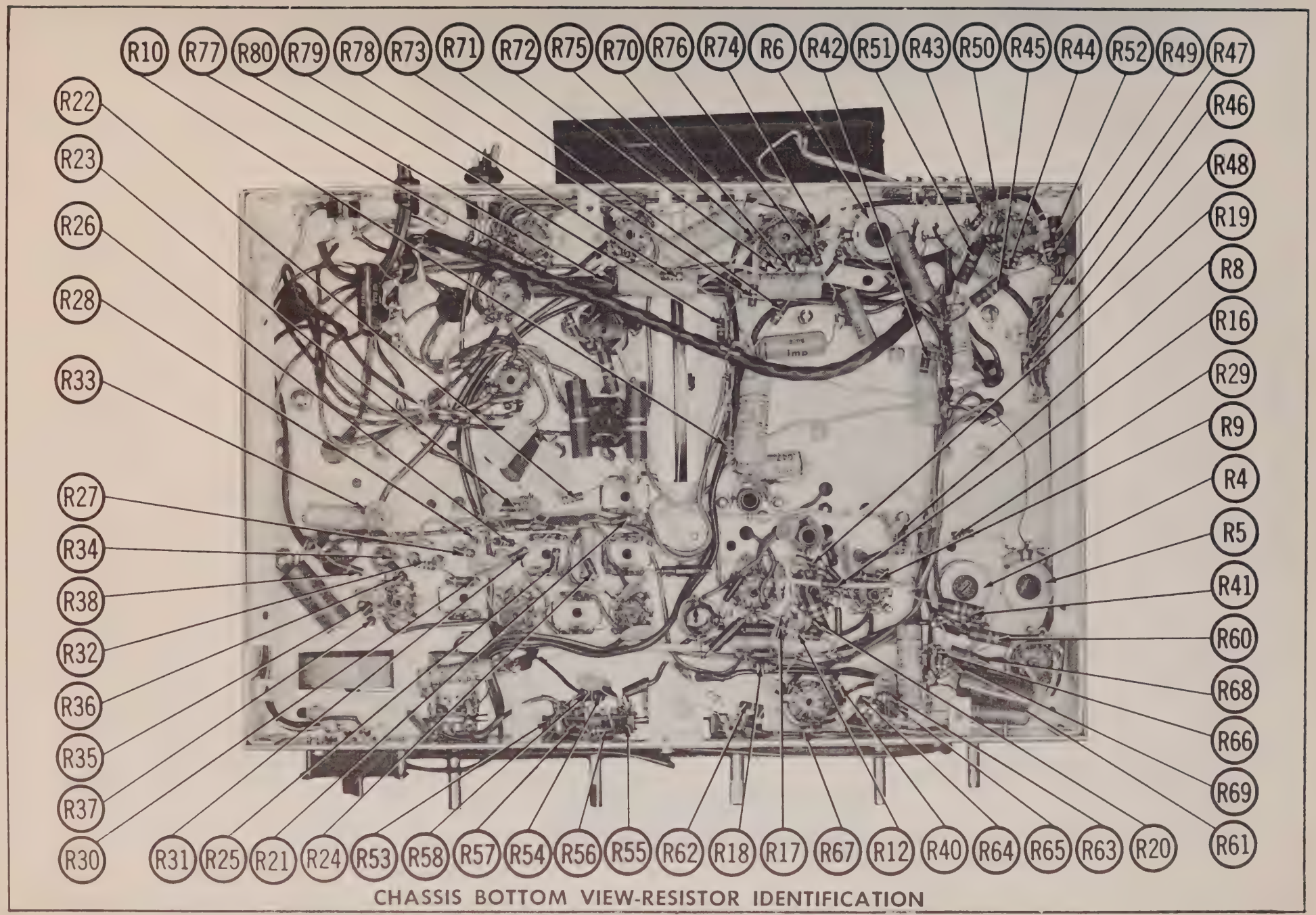
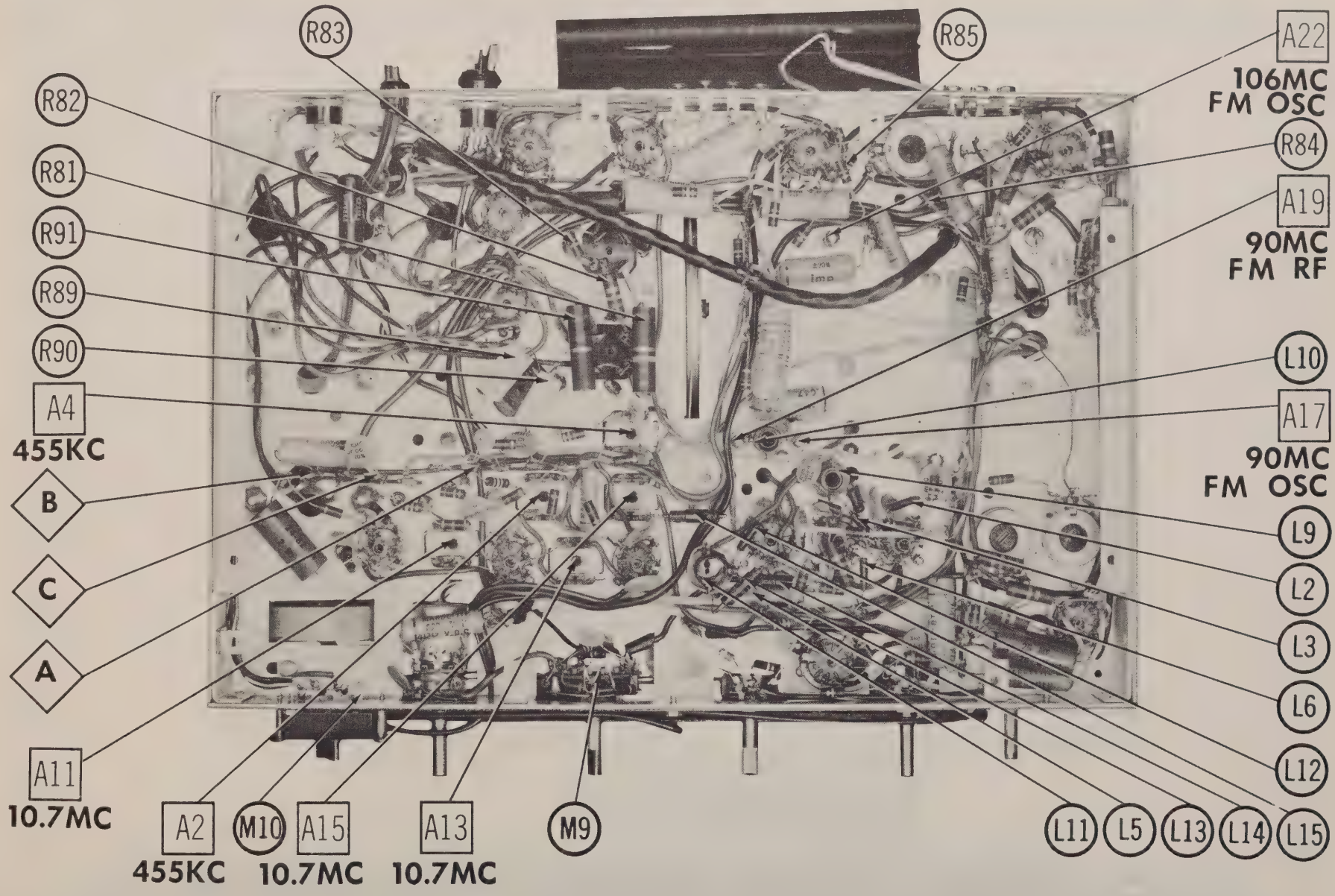


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW - RESISTOR, INDUCTOR, MISC & ALIGN IDENT

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1mfd	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	455KC (400∿ Mod)	AM	Tuning gang fully open	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	"	455KC (10KC Mod)	"	"	AC probe to tape output. Low side to chassis.	A5, R5	Adjust for MINIMUM deflection.
3.	"	High side to AM antenna terminal. Low side to chassis.	455KC (400∿ Mod)	"	"	DC probe to point Ⓐ. Common to chassis.	A6	"
4.	"	"	1500KC	"	1500KC	"	A7, A8, A9	Adjust for maximum deflection.
5.	"	"	600KC	"	600KC	"	A10	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	200mmf	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	10.7MC (Unmod)	FM	Point of non-interference	DC probe to point Ⓑ. Common to chassis.	A11, A12, A13, A14, A15	Adjust for maximum deflection.
7.	"	"	"	"	"	DC probe to point Ⓒ. Common to point Ⓑ.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	200mmf	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓑ. Low side to chassis.	A11, A12, A13, A14, A15	Disconnect stabilizing capacitor C4. Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
7.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A16	Reconnect stabilizing capacitor C4. Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	270Ω Carbon Resistor	High side to FM antenna terminal. Low side to chassis.	90MC (Unmod)	FM	90MC	DC probe to point Ⓑ. Common to chassis.	A17, A18, A19	Adjust for maximum deflection.
9.	"	"	106MC	"	106MC	"	A20, A21, A22	Adjust for maximum deflection. Repeat steps 8 and 9.

FIG. 1

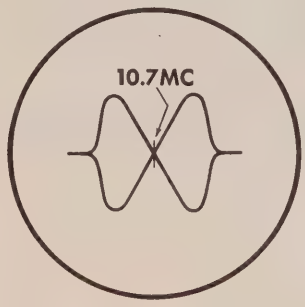
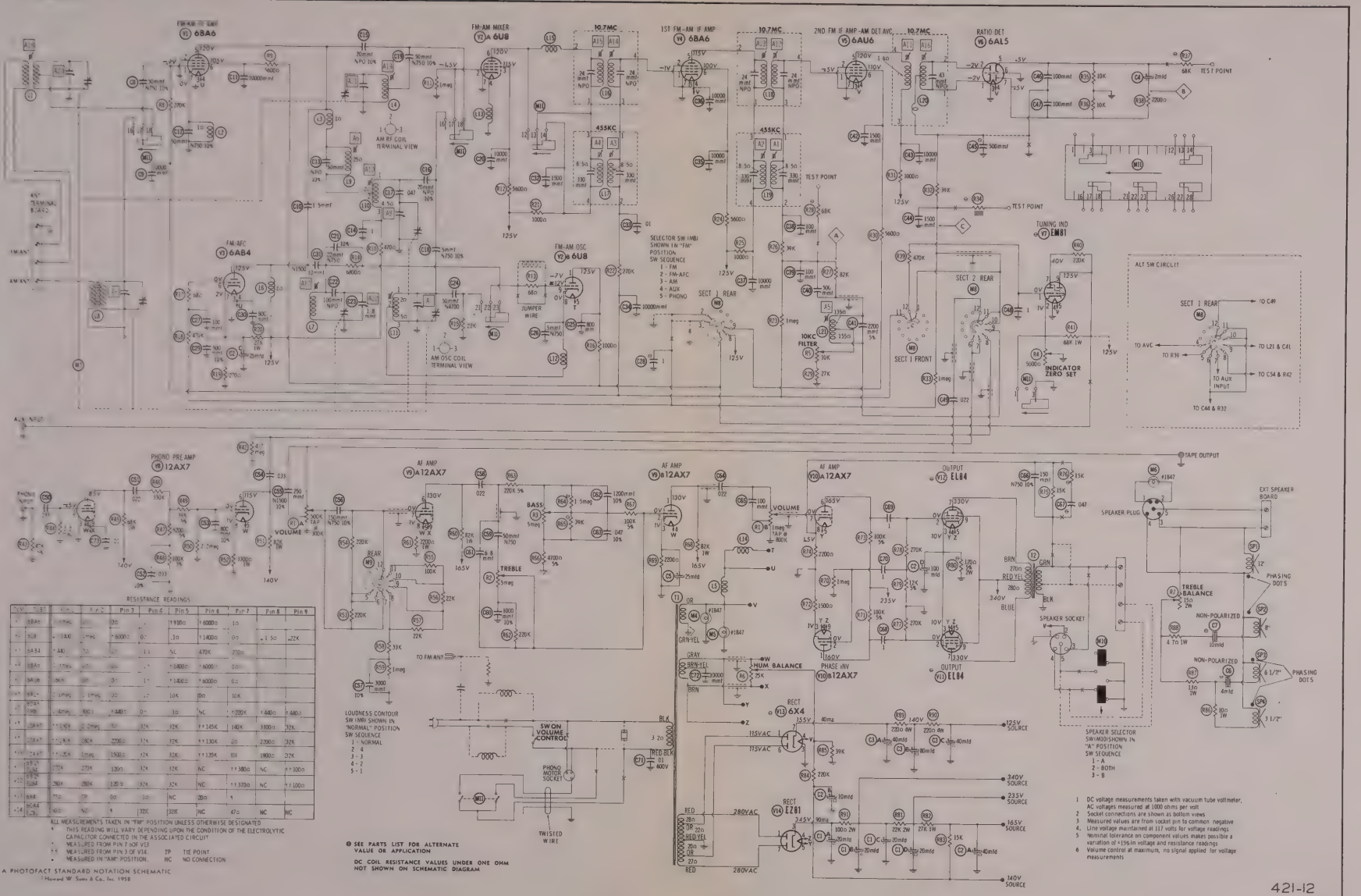
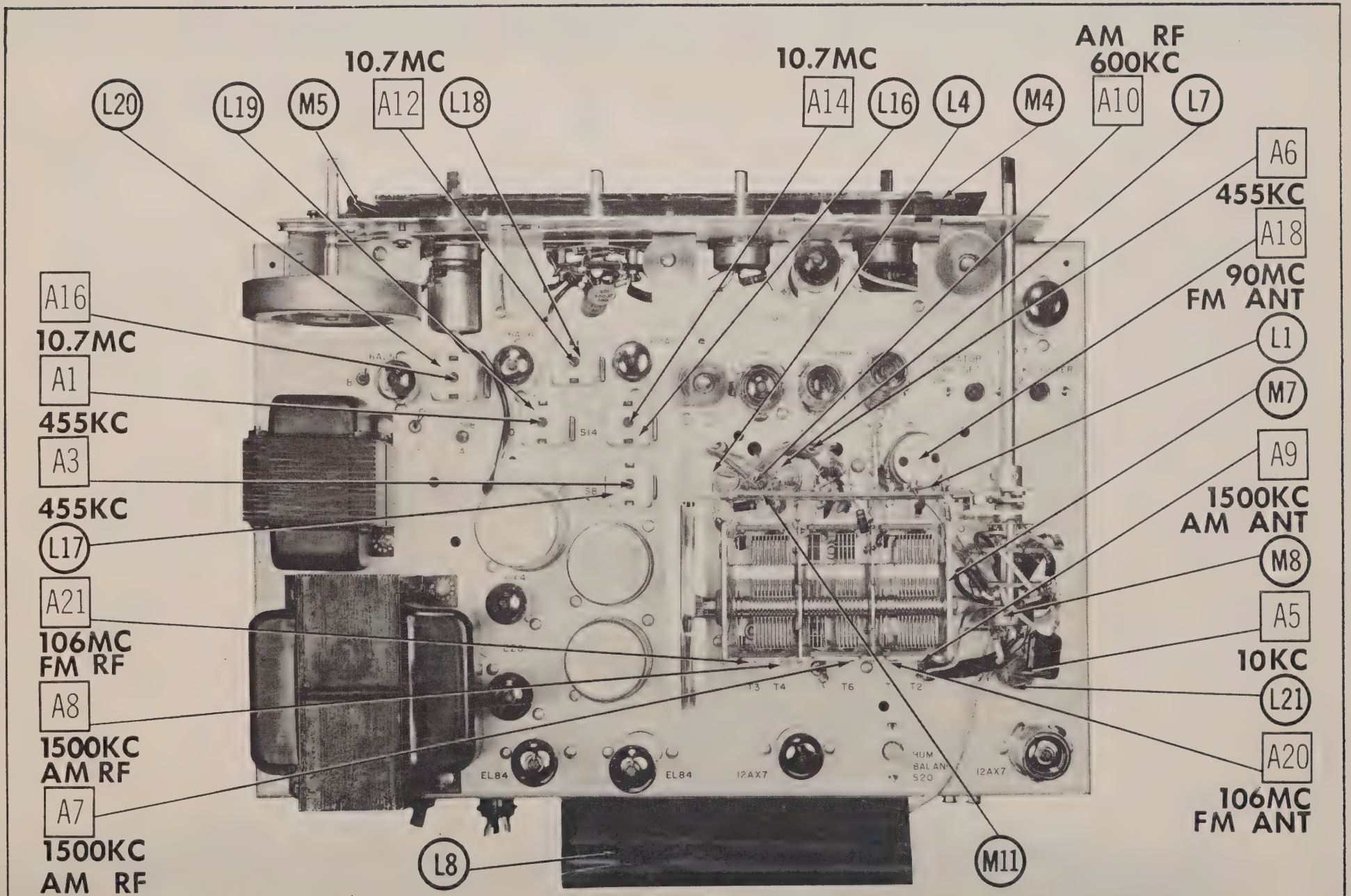
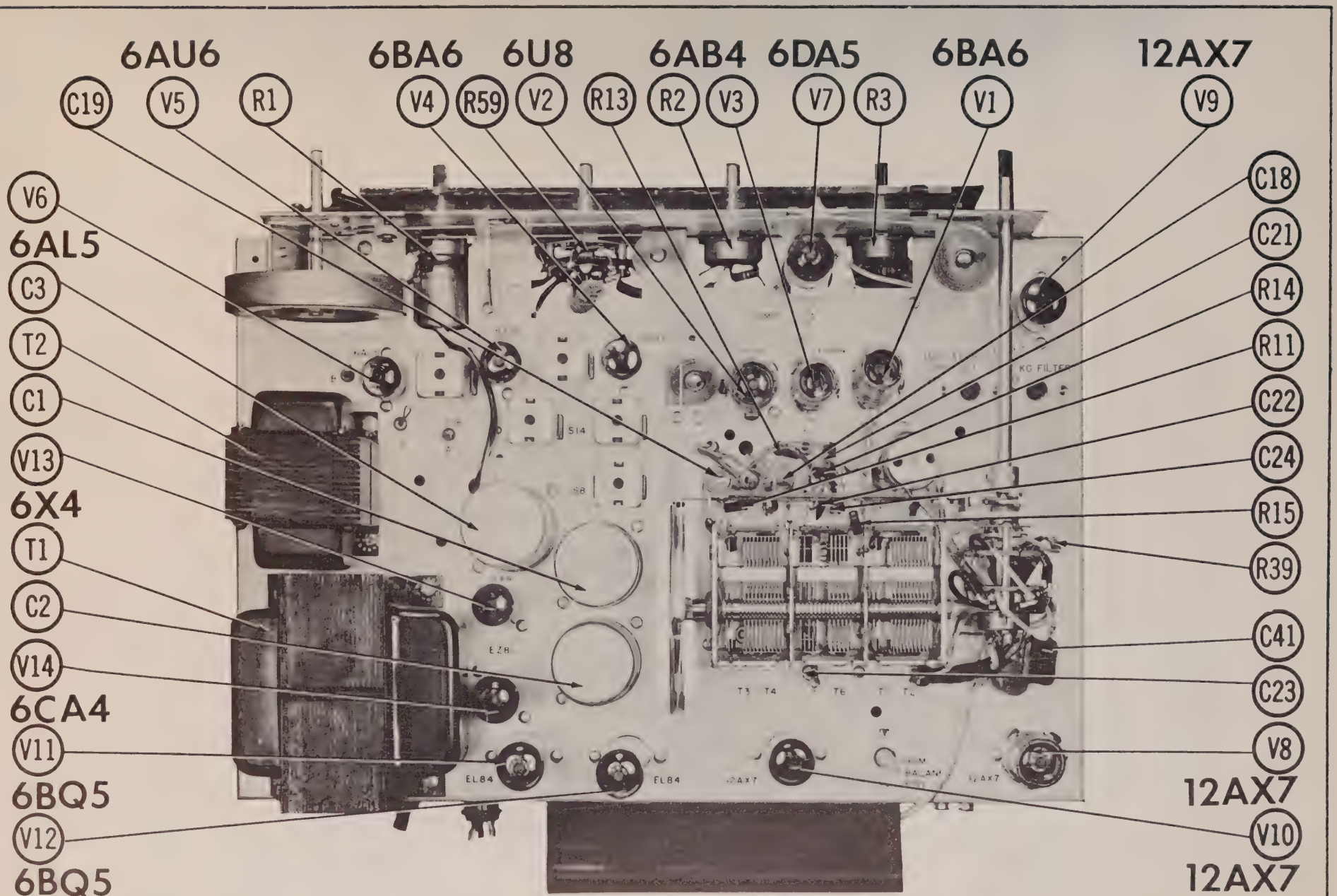


FIG. 2


FM-AM TUNER
V1 6BA6
FM-AM MIXER
V2A 6U8
10.7MC
1ST FM-AM IF AMP
V4 6BA6
10.7MC
2ND FM IF AMP-AM DET AVC
V5 6AU6
10.7MC
RATIO DET
V6 6AL5
TEST POINT
455KC
455KC
TEST POINT
TEST POINT
TUNING IND
V7 EM87
FM-AFC
V3 6AB4
FM-AM OSC
V2B 6U8
AM RF COIL TERMINAL VIEW
AM OSC COIL TERMINAL VIEW
JUMPER WIRE
SELECTOR SW (MB) SHOWN IN "FM" POSITION. SW SEQUENCE 1 - FM 2 - FM-AFC 3 - AM 4 - AUX 5 - PHONO
SECT 1 REAR
SECT 2 REAR
SECT 1 FRONT
10KC FILTER
INDICATOR ZERO SET
ALT SW CIRCUIT
SECT 1 REAR
TO C49
TO AVC
TO R39
TO L21 & C41
TO AUX INPUT
TO C54 & R42
TO C44 & R32
PHONO PRE AMP
V8 12AX7
AF AMP
V9A 12AX7
AF AMP
V9B 12AX7
AF AMP
V10A 12AX7
OUTPUT
V12 EL84
TAPE OUTPUT
EXT SPEAKER BOARD
SPEAKER PLUG
VOLUME
BASS
TREBLE
REAR
LOUDNESS CONTOUR SW (MR) SHOWN IN "NORMAL" POSITION. SW SEQUENCE 1 - NORMAL 2 - 4 3 - 3 4 - 2 5 - 1
TO FM ANT
SW ON VOLUME CONTROL
PHONO MOTOR SOCKET
TWISTED WIRE
VOLUME
HUM BALANCE
PHASE INV
V10B 12AX7
OUTPUT
V11 EL84
SPEAKER SOCKET
SPEAKER SELECTOR SW (MD) SHOWN IN "A" POSITION SW SEQUENCE 1 - A 2 - BOTH 3 - B
TREBLE BALANCE
NON-POLARIZED
NON-POLARIZED
PHASING DOTS
PHASING DOTS
RECT
V13 6X4
RECT
V14 EZ81
125V SOURCE
340V SOURCE
235V SOURCE
165V SOURCE
340V SOURCE
115VAC
280VAC
280VAC
RESISTANCE READINGS
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
* THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT
* MEASURED FROM PIN 7 OF V12
** MEASURED FROM PIN 3 OF V14
* MEASURED IN "AM" POSITION.
TP TIE POINT
NC NO CONNECTION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1958
© SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
1 DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt
2 Socket connections are shown as bottom views
3 Measured values are from socket pin to common negative
4 Line voltage maintained at 117 volts for voltage readings
5 Nominal tolerance on component values makes possible a variation of +15% in voltage and resistance readings
6 Volume control at maximum, no signal applied for voltage measurements
421-12



CHASSIS TOP VIEW - INDUCTOR, MISC & ALIGN IDENT



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	FM-AM RF Amp.	6BA6	
V2	FM AM Mixer-FM AM Osc.	6U8	
V3	FM AFC	6AB4	
V4	1st. FM-AM IF Amp.	6BA6	
V5	2nd. FM IF Amp. - AM Det. -AVC	6AU6	
V6	Ratio Detector	6AL5	
V7	Tuning Indicator	EM81	6DA5 ①
V8	Phono Preamplifier	12AX7	
V9	1st. AF Amp.	12AX7	
V10	2nd. AF Amp. -Phase Inv.	12AX7	
V11	Output	EL84	6BQ5 ①
V12	Output	EL84	6BQ5 ①
V13	Rectifier	6X4	
V14	Rectifier	EZ81	6CA4 ①

① Domestic type listed may not be directly interchangeable in some instances.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	350	24-153	AFH4-14	D0130	FP444	TMQ-12	Q-040	TVL-4763
B	▲20	350							
C	20	350							
D	■20	350							
C2A	▲40	350	24-157	AFH4-50-60	C1040	FP333		T-535	TVL-4606
B	■10	350			BBR25-6	TT15X100		MMT-625	
C	25	6							
D	▲100	15							
C3A	▲40	300	24-123		C0194		TMT-39	T-102	TVL-3561.5
B	■80	250					TD-60-350	MT-2540	
C	▲40	250							
C4	2	50	24-82	PRS50V2	BBR2-50	TC302	TD-2-50	MT-0502	TVA-1301
C5	25	25	24-50	PRS25V25	BBR25-25	TC26	TD-25-25	MT-0225	TVA-1205
C6	4	50NP	22-176 ①	NP-PRS50V4	BBR8-150 † BBR8-150 †	TC504	TD-8-150 † TD-8-150 †	MT-1508 † MT-1508 †	R2415 *
C7	10	25NP	24-160 ②	NP-PRS25V10	BBR20-25 † BBR20-25 †	TC45 † TC45 †	TD-20-150 † TD-20-150 †	MT-0220 † MT-0220 †	R2463 *

① Some versions may use 4mfd ⓐ 25VNP.
② Some versions may use 15mfd ⓐ 25VNP.
† Connect negative leads together.
* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C8	50					C10Q5U			N750 10%
C9	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C10	1.5			NPO-SI 1.5	TCZ-1R5	CTA6V15C	ZT-5515	5TCCB-V15	
C11	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C12	50					C10Q5U			N750 10%
C13	50			NPO-SI 50	DTZ-50	C10Q5C		5TCC-Q5	NPO 10%
C14	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C15	20			NPO-DI 20	DTZ-20	C10Q2C	ZT-542	5TCC-Q2	NPO 10%
C16	20			NPO-DI 20	DTZ-20	C10Q2C	ZT-542	5TCC-Q2	NPO 10%
C17	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C18	5			N750-SI 5	DTN-5	C10V5U	NT-555	5TCUB-V5	N750 10%
C19	50					C10Q5U			N750 10%
C20	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C21	22			N750-DI 22	DTN-22	C10Q22U		5TCU-Q22	N750 10%
C22	100			NPO-SI 100	TCZ-100	CTA6T1C	ZT-531	5TCC-T1	NPO
C23	1-8								N4700
C24	50								
C25	800			BPD-0008	DD-801	L10T8		5GA-T8	
C26	5			N750-SI 5	DTN-5	C10V5U	NT-555	5TCUB-V5	N750
C27	100			BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C28	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	①
C29	500				D6-501	5R5T47		MS-35	10%
C30	800			BPD-0008	DD-801	L10T8		5GA-T8	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C31	10								N1500
C32	1500			BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C33	.01	400		P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	
C34	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C35	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C36	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C37	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C38	100			BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C39	100			BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C40	500			BPD-0005	DD-501	L10T5	UC-535	5GA-T5	
C41	2200			1464-0022		1R5D22		MS-222	5%
C42	1500			BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C43	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C44	1500			BPD-0015	DD-152	BYA10D15	DC5215	5HK-D15	
C45	500			BPD-0005	DD-501	L10T5	UC-535	5GA-T5	②
C46	100			BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C47	100			BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C48	.1	200		P288N-1	DF-104	CUB2P1	GEM-201	2TM-P1	
C49	.022	400		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C50	.033	400		P488N-033	DF-303	CUB6S33	GEM-4133	4TM-S33	
C51	.022	400		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C52	.033	400							10%
C53	800					1R5T8		MS-38	10%
C54	.033	400		P488N-033	DF-303	CUB6S33	GEM-4133	6TM-S33	
C55	250								N1500 10%
C56	150			N750-DI 150	DTN-150	C10T15U		5TCU-T15	N750 10%
C57	3000					1R5D3		MS-23	10%
C58	.022	400		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C59	50					C10Q5U			N750
C60	1000					1R5D1	MCB255	MS-21	10%
C61	6.8			NPO-SI 6.8	DTZ-6R8	CTA6V68C	ZT-5568	5TCCB-V68	
C62	1200					1R5D12		MS-212	10%
C63	.047	400							10%
C64	.022	400		P488N-022	DD-203	CUB4S22	GEM-4122	4TM-S22	
C65	100			BPD-0001	DD-101	L10T1	UC-531	5GA-T1	
C66	150			N750-DI 150	DTN-150	C10T15U		5TCU-T15	N750 10%
C67	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C68	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C69	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C70	.1	400		P488N-1	DF-104	CUB4P1	GEM-401	4TM-P1	
C71	.01	600		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	
C72	10000			BPD-01	DD-103	BYA6S1	DC511	5HK-S1	
C73	.01	400		P488N-01	D6-103	CUB4S1	GEM-411	4TM-S1	

① Some versions may use .01mfd in this application. ② Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PILOT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	36-68				UE1509S	Volume, Tap ⓐ 300K
B	1meg	½						Volume, Tap ⓐ 800K
C	Switch							
R2A	5meg	½	37-35	B-87	A47-5meg-S	Q11-141	U67	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	5meg	½	37-35	B-87	A47-5meg-S	Q11-141	U67	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	5000Ω	½	39-42	BX-10	A47-5000-S	Q11-114	TA53L	Indicator Zero Set
B	Shaft			Not Req.	FKS-1/4	RQ	Not Req.	
R5A	10K	½	39-46	AB-14	A47-10K-S	B11-116	TA14L	10KC Filter
B	Shaft			AK-1	FKS-1/4	SK2	Not Req.	
R6A	25K	½	39-44	AB-26	A47-25K-S	B11-120	TA253L	Hum Balance
B	Shaft			AK-1	FKS-1/4	SK2	Not Req.	
R7A	15Ω	2(WW)	39-51	WW-150	A43-20	WPK20	R15L	Treble Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	PILOT PART No.	NOTES
R8	270K			
R9	5600Ω			
R10	470Ω			
R11	1meg			
R12	5600Ω			
R13	68Ω			
R14	6800Ω			
R15	22K			
R16	1000Ω			
R17	68Ω			
R18	470K			
R19	270Ω			
R20	27K	1		
R21	1000Ω			
R22	270K			
R23	1meg			
R24	5600Ω			
R25	1000Ω			
R26	39K			
R27	82K			
R28	68K			
R29	27K			
R30	5600Ω			
R31	1000Ω			
R32	39K			
R33	1meg			
R34	68K			
R35	10K			
R36	10K			
R37	68K			
R38	2200Ω			
R39	470K			
R40	220K			
R41	68K	1		
R42	4.7meg			
R43	47K 5%			
R44	2.2meg			
R45	68K	1		
R46	330K			
R47	8200Ω 5%			
R48	100K 5%			
R49	39K 5%			
R50	2.2meg			
R51	82K	1		
R52	3300Ω	1		
R53	220K			
R54	220K			
R55	100K			
R56	22K			
R57	22K			
R58	33K			
R59	1meg			
R60	82K	1		
R61	2200Ω	1		
R62	220K			
R63	220K 5%			
R64	1.5meg			Note 1
R65	39K			Note 2
R66	4700Ω 5%			
R67	100K 5%			
R68	82K	1		
R69	2200Ω			
R70	1meg			
R71	100K 5%			
R72	1500Ω			
R73	100K 5%			
R74	2200Ω			
R75	15K			
R76	15K			
R77	270K			
R78	270K			
R79	12K 5%			
R80	120Ω 5%	2		Note 3
R81	22K	2		
R82	27K	1		
R83	15K			
R84	220K			
R85	39K			
R86	10Ω	1		
R87	13Ω	1		
R88	4.7Ω	1		
R89	220Ω	4(WW)		
R90	220Ω	4(WW)		
R91	100Ω	2		

Note 1. Not used in Model HF-30.
Note 2. Model HF-30 uses 150K in this application.
Note 3. Some versions may use 150Ω in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA PILOT PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.	70-81					
L2	Cathode Choke	75-33	19-1004	SW-631	4529		5 Microhenries
L3	RF Choke	75-33	19-1004	SW-631	4529		5 Microhenries
L4	FM RF Coil	71-42					
L5	Fil. Choke	75-19	19-1001	BC-562	4604		1.5 Microhenries
L6	RF Choke	75-33	19-1004	SW-631	4529		5 Microhenries
L7	FM Osc. Coil	72-77					
L8	Loop Stick	270-54					
L9	IF Trap	79-102					
L10	AM RF Coil	71-43					
L11	AM Osc. Coil	72-78					
L12	Cathode Choke	75-33	19-1004	SW-631	4529		5 Microhenries
L13	Fil. Choke	75-19	19-1001	BC-562	4604		1.5 Microhenries
L14	Fil. Choke	75-19	19-1001	BC-562	4604		1.5 Microhenries
L15	RF Choke	75-19	19-1001	BC-562	4604		1.5 Microhenries
L16	1st. FM IF	273-151	16-3487	FM-254	1463		
L17	1st. AM IF	273-129	16-6758	BC-352	12-C1	RF-1	
L18	2nd. FM IF	273-151	16-3487	FM-254	1463		
L19	2nd. AM IF	273-129	16-6758	BC-353	12-C2	RF-2	
L20	Ratio Det.	279-72	17-3498	FM-255	1465		
L21	10KC Filter	79-106					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA PILOT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .97A SEC. 3 6.3VCT @ 3.3A	550VCT @ .090A Tap @ 300VCT @ .040A	6.3V @ 2.8A	55-59						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA PILOT PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	8000Ω CT	6-8Ω	56-52	Z1405 ①			A-3304 ①	22S66 ①	S-24A ①	① Drill new mounting holes.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA PILOT PART No.	QUAM PART No.	NOTES
SP1	12"	PM	6-8Ω	41-43	21A6A	
SP2	8"	PM	6-8Ω	41-39	8A6	
SP3	6½"	PM	3-4Ω	41-40	6A2I	
SP4	3½"	PM	6-8Ω	41-44	3A15TZ7.4	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA PILOT PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	REMARKS
M1						

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

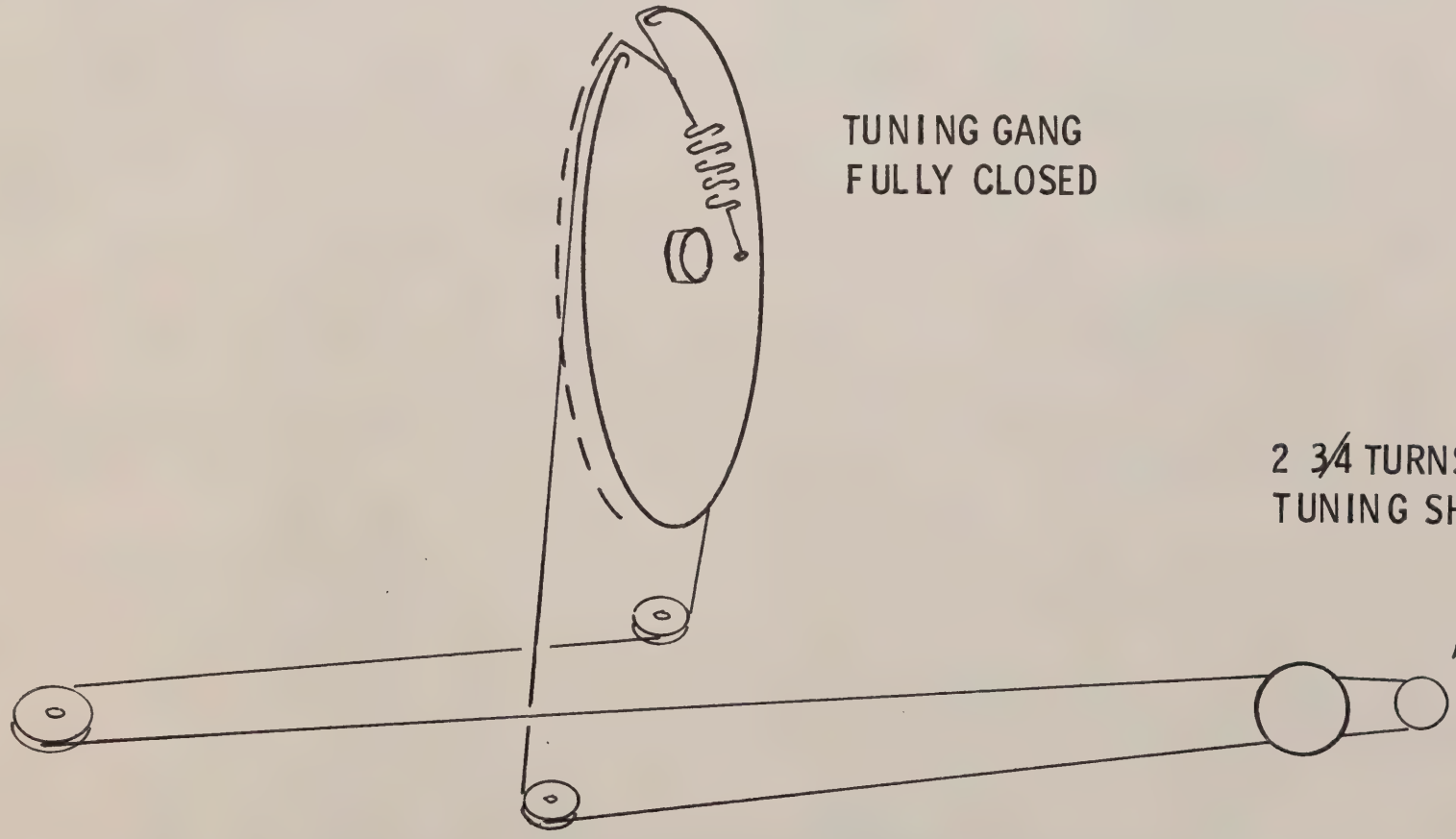
ITEM No.	REPLACEMENT DATA PILOT PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	(78RPM)	†G-6 or ♦ G-6D	†W-69S or ♦W-69D	† Jewel ♦ Diamond
M3	(LP)	†G-4 or ♦G-4D	†W-69MGS or ♦ W-69MGD	

MISCELLANEOUS

ITEM No.	PART NAME	PILOT PART No.	NOTES
M4	Lamp	68-10	#1847
M5	Lamp	68-10	#1847
M6	Lamp	68-10	#1847
M7	Tuning Cap.	26-60	6 Gang (AM Sections: Ant. 23-488mmf, RF 21-485mmf, Osc. 24-172mmf)
M8	Switch	100-124	Function, 6 Position, Two Wafer Rotary & DPST Snap Rotary on Rear
M9	Switch	100-117	Loudness, 4 Position, Single Wafer Rotary
M10	Switch	101-42	Speaker Selector, DP3T Slide Type
M11	Switch	101-43	FM-FM AFC-AM, Slide Type
M12	Motor		Phono Motor, Part of Changer 108-31

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



DIAL CORD STRINGING

PHOTOFACT* Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

REGENCY
MODELS HF-50A, HF-50K

REGENCY
MODELS HF-50A, HF-50K

MODEL HF-50A

REGENCY
MODELS HF-50A, HF-50K

TRADE NAME	Regency Models HF-50A, HF-50K
MANUFACTURER	Regency Div., I.D.E.A., Inc., 7900 Pendleton Pike, Indianapolis 26, Indiana
TYPE SET	AC Operated Audio Amplifier
TUBES (Four)	Types 6AN8 AF Amp. - Phase Inv., (2) 6CA7/EL34 Output, 5U4GB Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.6 Amp. @ 117 Volts AC (165 Watts)

BIAS ADJUSTMENT (R1-R2)

Connect a DC voltmeter from R1 arm to chassis. Adjust R1 for a meter reading of 35 volts. Connect the DC voltmeter from pin 8 (cathode) of V2 to pin 8 (Cathode) of V3. Adjust R2 for zero meter reading.

SET 421 FOLDER 13

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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H629

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amp. - Phase Inv.	6AN8	
V2	Output	6CA7/EL34	Note 1
V3	Output	6CA7/EL34	Note 1
V4	Rectifier	5U4GB	

Note 1. Equivalent type listed may not be directly interchangeable.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REGENCY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲20	500	30-011-12 ①	AFH4-19-20	D0179.5	FP475		T-205	TVL-4834
B	■20	500						MT-4520	
C	▲20	450							
D	20	450							
C2	100	50	300-109-8	PRS50V100	BR1005	TC3501	TD-100-50	MTH-5010	TVA-1310

① Alternate Part #300-001-12

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REGENCY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C3	.5	200	500-140-125	P288N-5		CUB2P5	GEM-205	2TM-P5	
C4	82	1000	100-935	1468-HV-000082	DD-820				10%
C5	750	500	100-936	1468-00075	DD-751	1W5T75		1FM-375	10%
C6	.27	600	500-140-322	P688N-27		CUB6P25	GEM-6027	6TM-P25	
C7	.27	600	500-140-322	P688N-27		CUB6P25	GEM-6027	6TM-P25	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REGENCY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	10K	½	100-585-4	AB-14	A47-10K-S	B11-116	U20	Bias
B	Shaft			AK-1	FKS-1/4	SK1	Not Req.	
R2A	10K	½	100-585-4	AB-14	A47-10K-S	B11-116	U20	Bias
B	Shaft			AK-1	FKS-1/4	SK1	Not Req.	

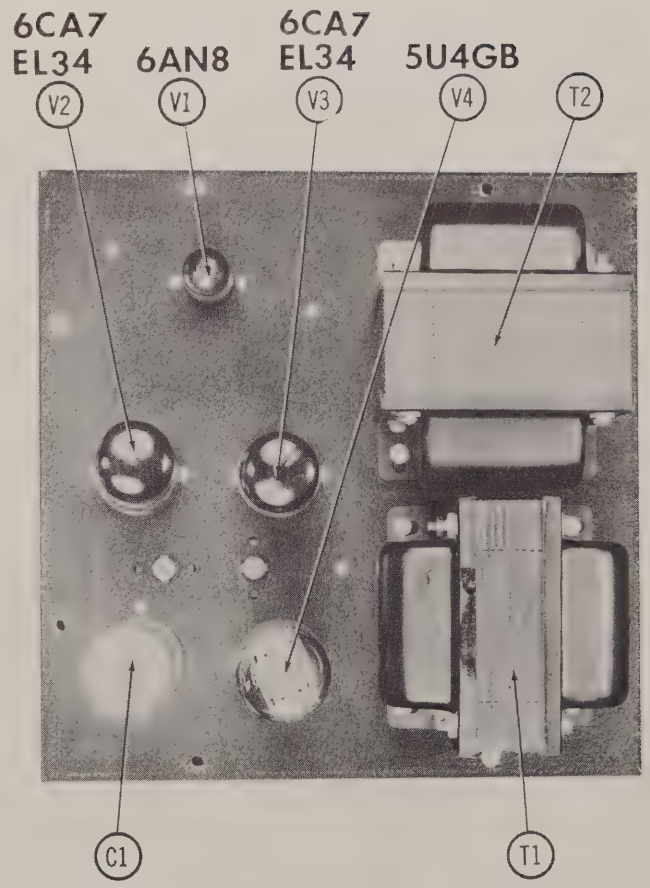
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	REGENCY PART No.	NOTES
R3	470K		30-000-474	
R4	270K		30-003-274	
R5	180K		30-033-184	
R6	680Ω		30-003-680	
R7	47Ω		30-003-470	
R8	1000Ω		30-003-102	
R9	47K	1	30-004-473	Note 1
R10	47K	1	30-004-473	Note 1
R11	100K		30-003-104	Note 2
R12	1000Ω		30-003-102	
R13	10Ω		30-003-100	Note 3
R14	100K		30-003-104	Note 2
R15	1000Ω		30-003-102	
R16	10Ω		30-003-100	Note 3
R17	47Ω		30-003-470	
R18	4700Ω		30-003-472	
R19	680Ω	1	30-004-681	
R20	50Ω	10(WW)	100-934	
R21	6800Ω		30-004-682	
R22	47K		30-003-473	

Note 1. R9 and R10 are a matched pair.
Note 2. R11 and R14 are a matched pair.
Note 3. R13 and R16 are a matched pair.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	REGENCY PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ 1.6A	740VCT @ .250A Tap @ 52V @ .006A	5V @ 2.6A	500-348						
	SEC. 3									
	6.3VCT @ 3.3A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	REGENCY PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4000Ω CT Taps @ 250Ω fromCT	16Ω, 8Ω	500-347					22S63 ①	S-152A①	① Drill new mounting holes.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	REGENCY PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.006A	RR8Y1	1159	D-5410	10	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			REGENCY PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	5A 250V	3AG	341001	312005. (3AG 5A 250V)	341001	MTH5	HKP

MISCELLANEOUS

ITEM No.	PART NAME	REGENCY PART No.	NOTES
M3	Switch	SS26	Power Off-On, SPST, Slide Type

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

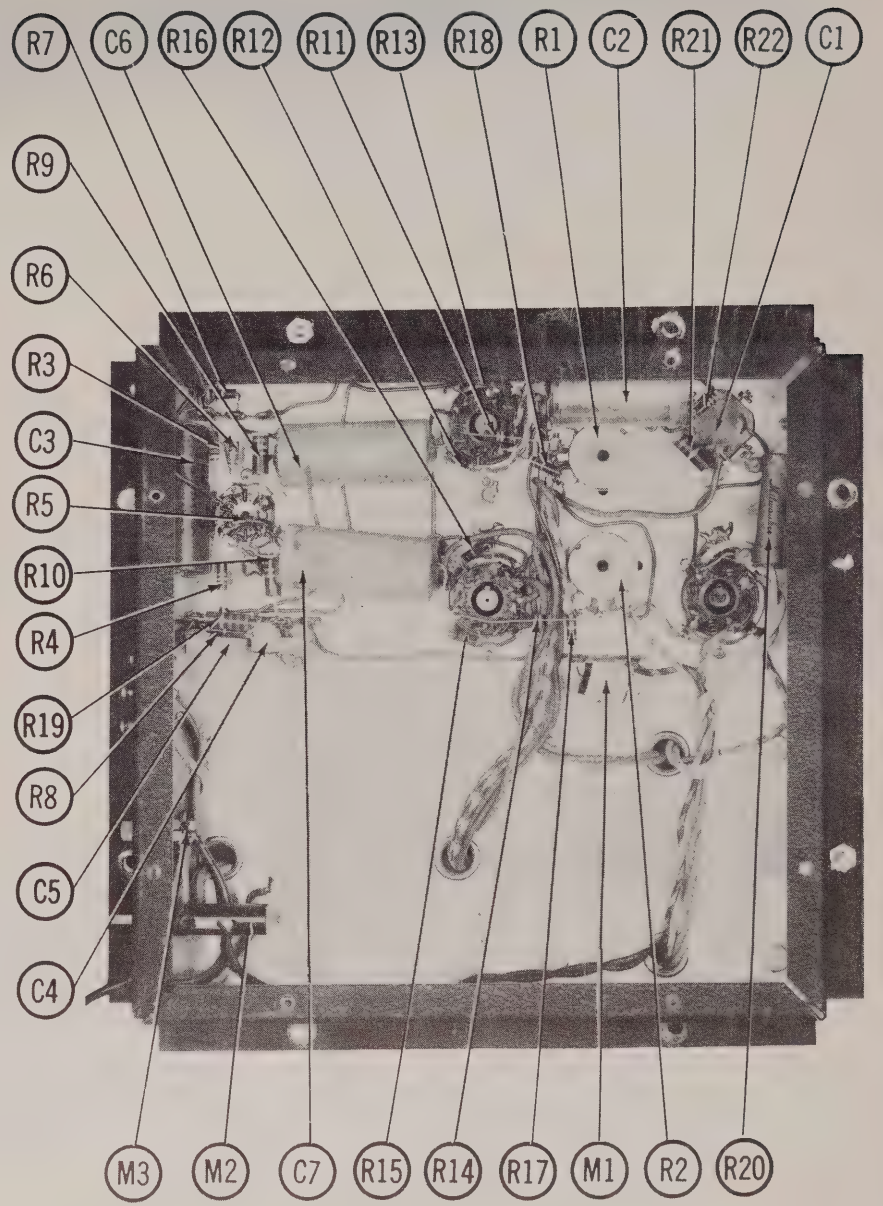
NAME	PART NO.	DESCRIPTION
Cage Ass'y	600-075	
Cover	500-346	Bottom
Cover	100-561-3	Glass

WIRING DATA

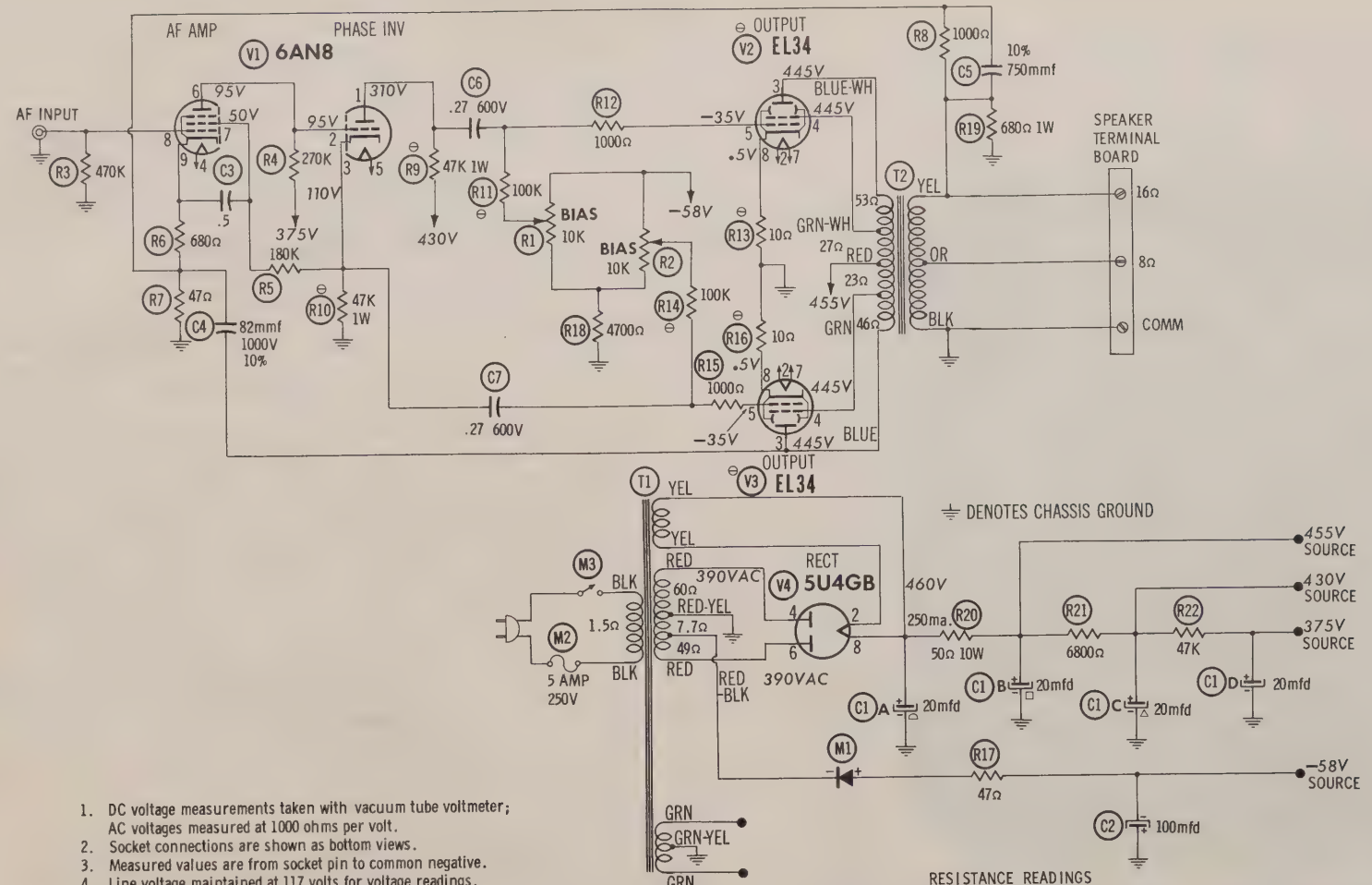
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW



REGENCY
MODELS HF-50A, HF-50K
FOLDER 13



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AN8	†54K	†320K	47K	.1Ω	.1Ω	†320K	225K	470K	725Ω
V2	EL34	0Ω	.1Ω	†130Ω	†77Ω	100K	TP	.1Ω	10Ω	
V3	EL34	0Ω	.1Ω	†120Ω	†73Ω	100K	TP	.1Ω	10Ω	
V4	5U4GB	NC	¶	NC	60Ω	NC	57Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
† MEASURED FROM PIN 8 OF V4.
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT* Folder

*TRADE MARK

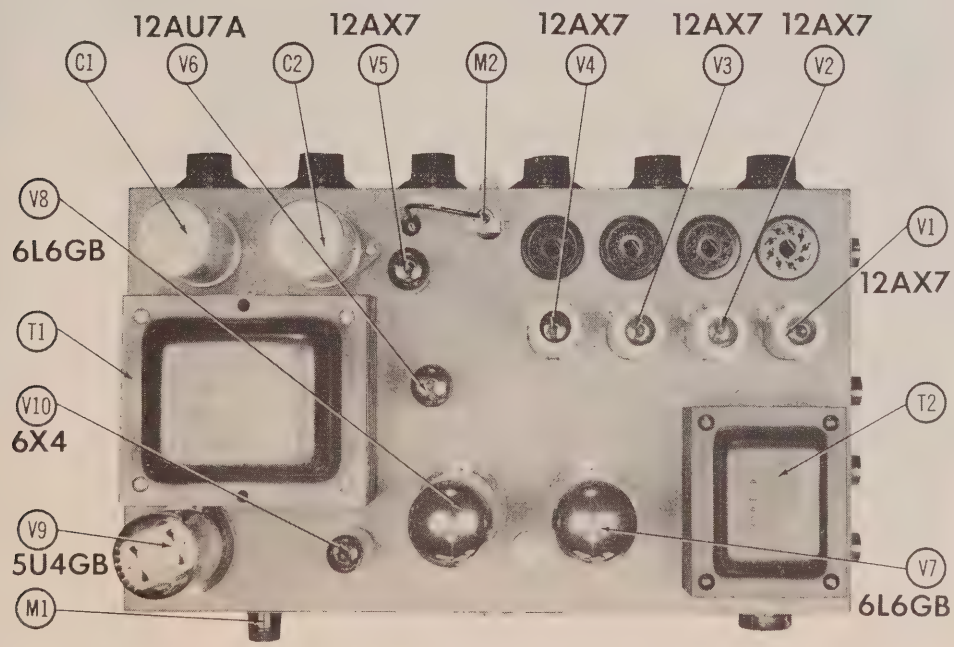
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

STROMBERG-CARLSON MODEL AU-57

STROMBERG-CARLSON
MODEL AU-57

STROMBERG-CARLSON
MODEL AU-57

TRADE NAME	Stromberg-Carlson Model AU-57
MANUFACTURER	Stromberg-Carlson National Service Dept., 1400N. Goodman St., Rochester 3, N.Y.
TYPE SET	AC Operated Four Channel Audio Amplifier
TUBES	Ten
POWER SUPPLY	105-125 Volts AC-50/60 Cycle RATING .93 Amp. @117 Volts AC (100 Watts)



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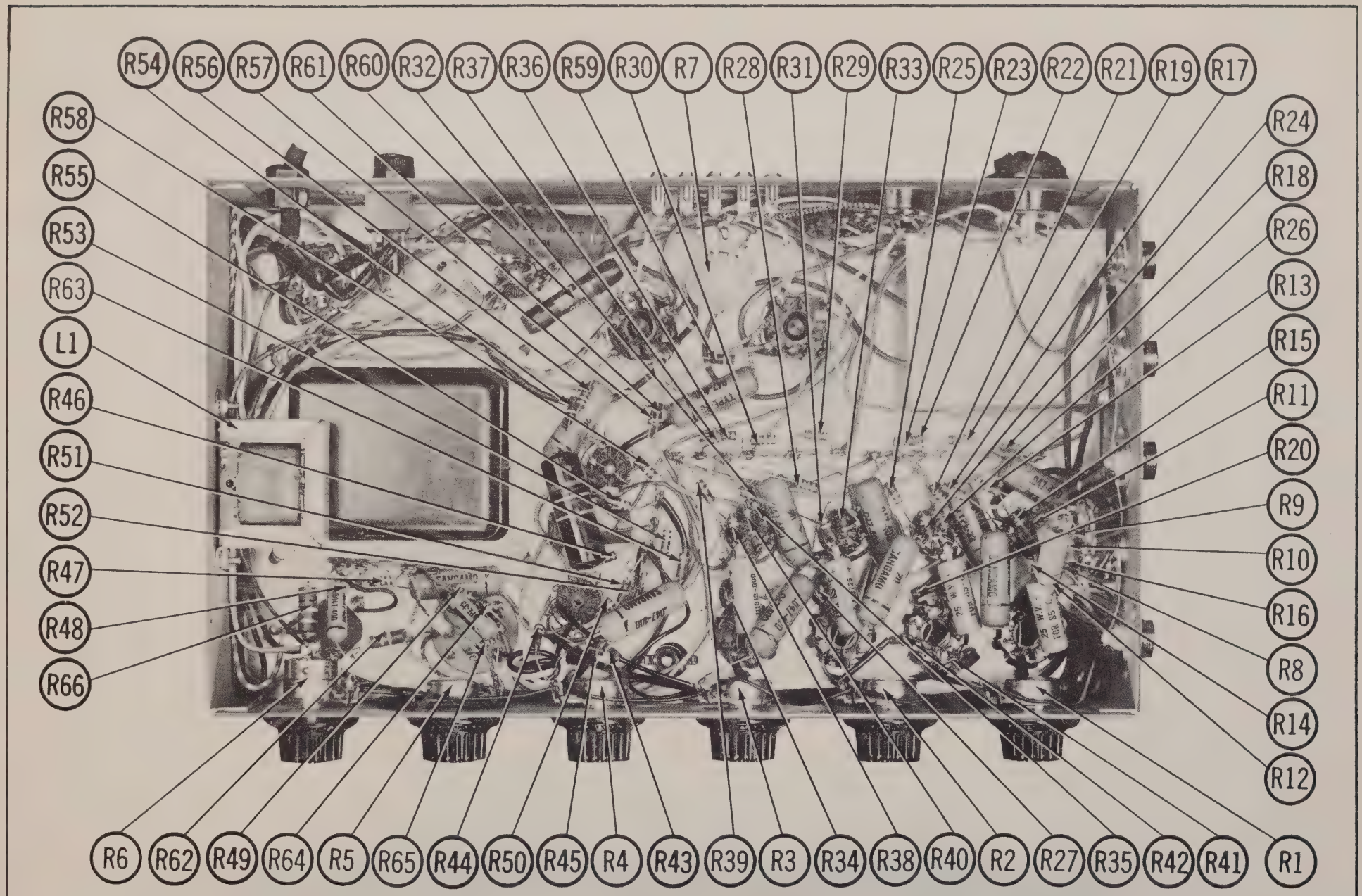


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Aux. Preamplifier	12AX7	
V2	Mic. #1 Preamplifier	12AX7	
V3	Mic. #2 Preamplifier	12AX7	
V4	Mic. #3 Preamplifier	12AX7	
V5	AF Amplifier	12AX7	
V6	AF Amp. -Phase Inv.	12AU7A	
V7	Output	6L6G	
V8	Output	6L6G	
V9	Rectifier	5U4GB	
V10	Rectifier	6X4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Stromberg-Carlson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■ 30	500	34050	AFH2-72	B0530	FP284	TMD-62	D-275	TVL-2937
B	▲ 30	500							
C2A	▲ 30	450	35590	AFH4-15-30	D0144	FP444.8	TMQ-14	Q-051	TVL-4769.4
B	■ 30	450					TD-4-450		
C	▲ 15	350							
D	15	250							
C3	10	25		PRS25V10	BBR10-25	TC22	TD-10-25	MT-0210	TVA-1204
C4	10	25		PRS25V10	BBR10-25	TC22	TD-10-25	MT-0210	TVA-1204
C5	10	25		PRS25V10	BBR10-25	TC22	TD-10-25	MT-0210	TVA-1204
C6	10	25		PRS25V10	BBR10-25	TC22	TD-10-25	MT-0210	TVA-1204
C7	50	6		SRE6V50	BBR50-6	TC29	TD-50-6	MMT-650	TVA-1100
C8	50	50		PRS50V50	BR505	TC39	TD-50-50	MT-0550	TVA-1308

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

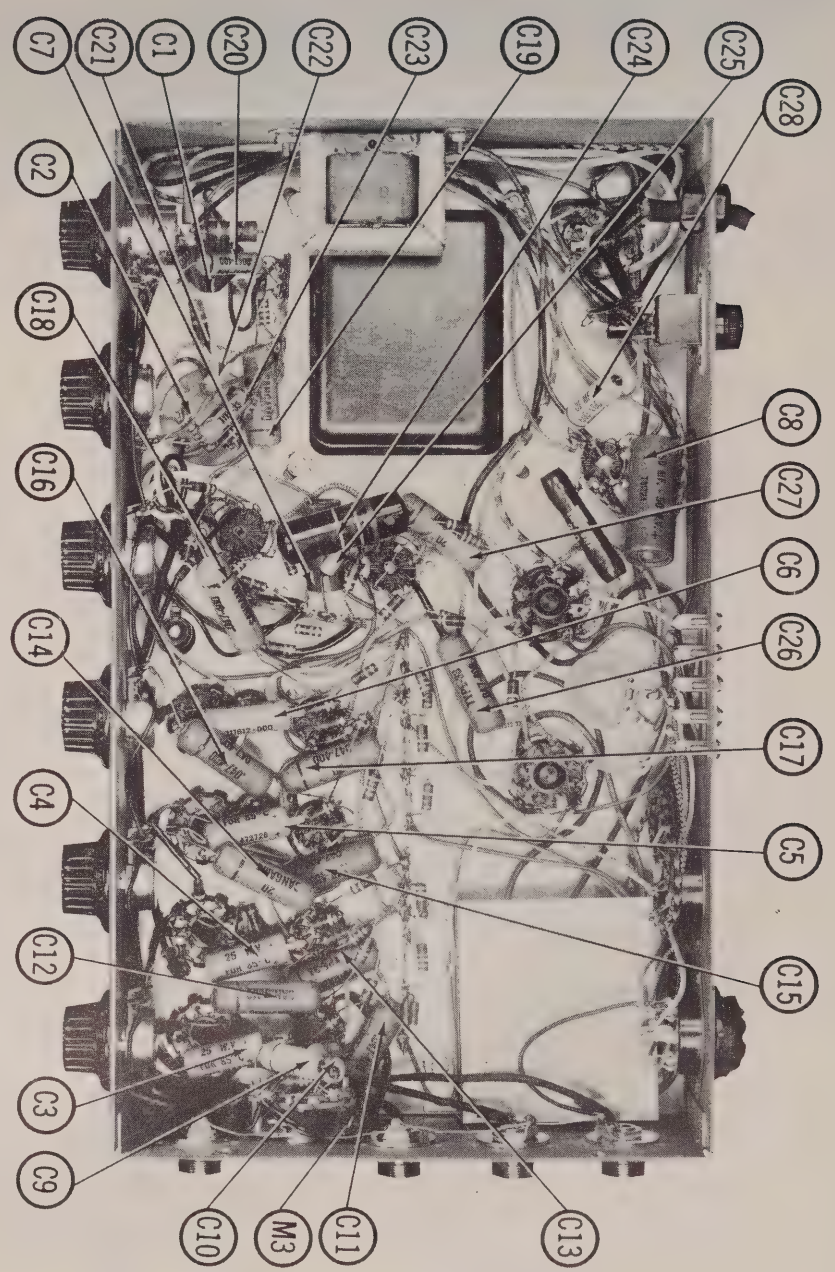
ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Stromberg-Carlson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C9	.0022	400		P488N-0022	D6-222	CUB6D22	GEM-6222	6TM-D22	
C10	.001	600		P688N-001	D6-102	CUB6D1	GEM-621	6TM-D1	
C11	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C12	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C13	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C14	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C15	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C16	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C17	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C18	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C19	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C20	.0047	400		P488N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C21	470			SI470	D6-471	LT6T47	UC-5347	5GA-T47	
C22	470			SI470	D6-471	LT6T47	UC-5347	5GA-T47	
C23	.0047	400		P488N-0047	D6-472	CUB6D47	GEM-6247	6TM-D47	
C24	.22	400		P488N-22		CUB4P22	GEM-4022	4TM-P22	
C25	470			SI470	D6-471	LT6T47	UC-5347	5GA-T47	
C26	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C27	.047	400		P488N-047	DF-503	CUB4S47	GEM-4147	4TM-S47	
C28	.01	600		P688N-01	D6-103	CUB6S1	GEM-611	6TM-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Stromberg-Carlson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1meg	½	46313	B-70	A47-1meg-Z	Q13-137	U53	Input
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1meg	½	46313	B-70	A47-1meg-Z	Q13-137	U53	Microphone 1
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R3A	1meg	½	46313	B-70	A47-1meg-Z	Q13-137	U53	Microphone 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1meg	½	46313	B-70	A47-1meg-Z	Q13-137	U53	Microphone 3
B	Shaft			Not Req.	FS-3	Not Req.	Not Req	
R5A	5meg	½	145630	B-88	A47-5meg-Z	Q13-141	U65	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R6A	5meg	½	145631	B-88	A47-5meg-Z	Q13-141	U65	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	
R7A	100Ω	2(WW)	145632	WN-101	A43-100	W11-084	R100L	Hum Balance
B	Shaft			Not Req.	FKS-1/4	SK5	Not Req.	

* Use KR with CRL "Red Label" Controls and KB with "Blue Label" Controls

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	Stromberg-Carlson PART No.	NOTES
R8	47K			
R9	1meg			
R10	15K			
R11	100K			
R12	1meg			
R13	150K			
R14	12K			
R15	150K			
R16	10K			
R17	270K			
R18	1500Ω			
R19	270K			
R20	1meg			
R21	47K			
R22	2700Ω			
R23	270K			
R24	150K			
R25	100K			
R26	1500Ω			
R27	1meg			
R28	47K			
R29	2700Ω			
R30	270K			
R31	150K			
R32	100K			
R33	1500Ω			
R34	1meg			
R35	47K			
R36	2700Ω			
R37	270K			
R38	150K			
R39	100K			
R40	1500Ω			
R41	100K			
R42	100K			
R43	100K			
R44	100K			
R45	150K			
R46	2700Ω			
R47	470K			
R48	470K			
R49	47K			
R50	150K			
R51	2700Ω			
R52	120K			
R53	4700Ω			
R54	150K			
R55	150K			
R56	4700Ω			
R57	15K			
R58	150K			
R59	150K			
R60	250Ω	10(WW)	46358	
R61	150K			
R62	15K	1		
R63	10K			
R64	10K			
R65	39K			
R66	100K	2		

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	125V Tap ⓐ 117V ⓐ .93A	674VCT ⓐ .112A	5V ⓐ 3A	161777						
		SEC. 3	SEC. 4							
		6.3V ⓐ 1A	6.3V ⓐ 2.1A							

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC. 1	REPLACEMENT DATA Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	6200Ω CT	70V Tap ⓐ 35V, 25V, 12.5V, 16Ω, 8Ω, 4Ω	161782							
		SEC. 2								
	TURNS RATIO									
	38	:1								

FUSES

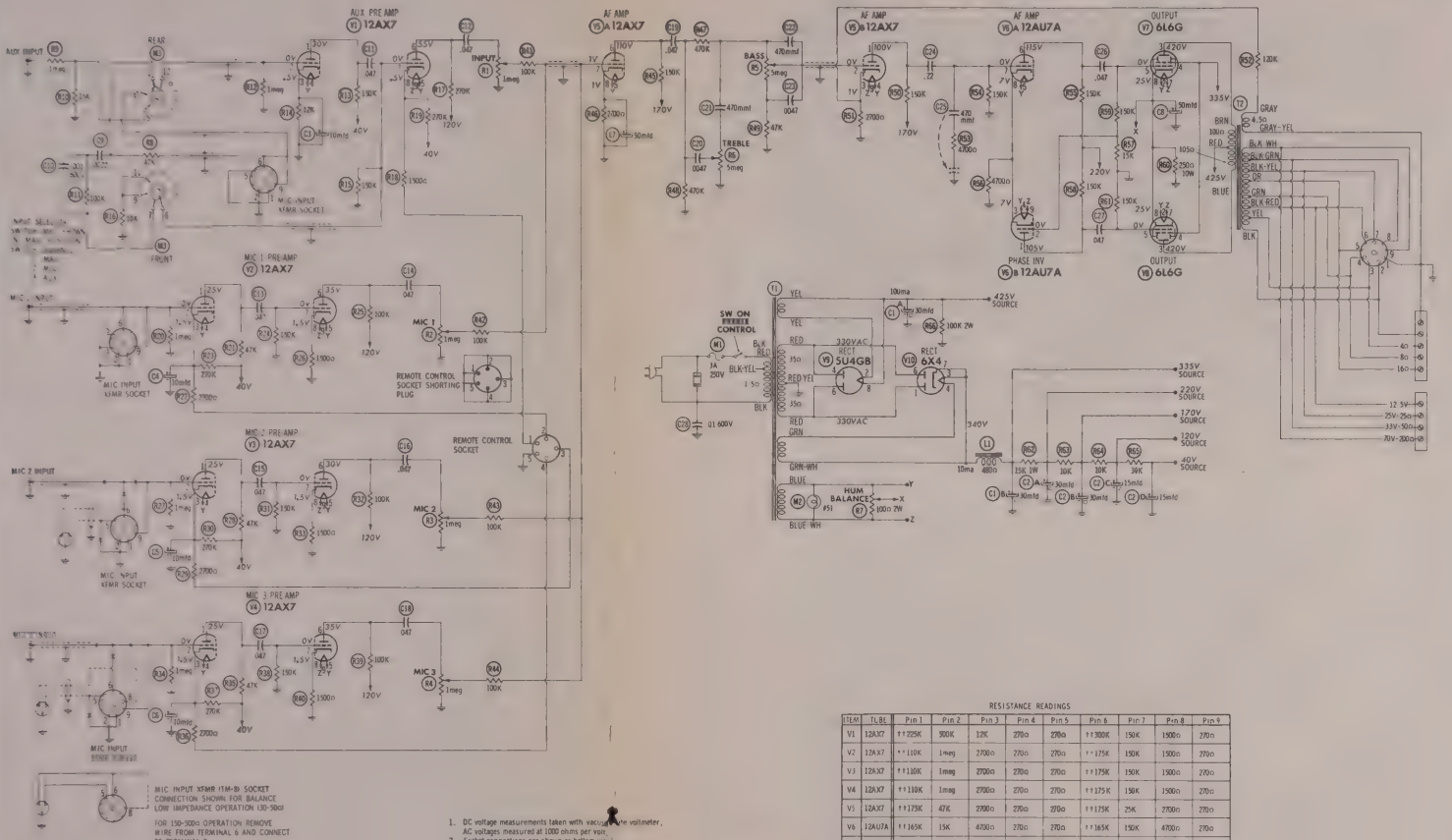
ITEM No.	TYPE	RATING	REPLACEMENT DATA Stromberg-Carlson PART No. FUSE	Stromberg-Carlson PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	3A 250V			312003. (3A 250V)	342001	AGC 3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	Stromberg-Carlson PART No.	NOTES
M2	Lamp		#51
M3	Switch	158650	Input Selector, Rotary Wafer Type

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	††225K	500K	12K	270Ω	270Ω	††300K	150K	1500Ω	270Ω
V2	12AX7	††110K	1meg	2700Ω	270Ω	270Ω	††175K	150K	1500Ω	270Ω
V3	12AX7	††110K	1meg	2700Ω	270Ω	270Ω	††175K	150K	1500Ω	270Ω
V4	12AX7	††110K	1meg	2700Ω	270Ω	270Ω	††175K	150K	1500Ω	270Ω
V5	12AX7	††175K	47K	2700Ω	270Ω	270Ω	††175K	25K	2700Ω	270Ω
V6	12AU7A	††165K	15K	4700Ω	270Ω	270Ω	††165K	150K	4700Ω	270Ω
V7	6L6GB	0Ω	270Ω	†100Ω	††480Ω	150K	TP	270Ω	250Ω	
V8	6L6GB	0Ω	270Ω	†104Ω	††480Ω	150K	NC	270Ω	250Ω	
V9	5U4GB	NC	¶	NC	350Ω	NC	350Ω	TP	¶	
V10	6X4	350Ω	NC	¶	¶	NC	350Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT
† MEASURED FROM PIN 8 OF V9
†† MEASURED FROM PIN 7 OF V10
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom view.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

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*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATIONS

TRUETONE MODEL DC3884

TRUETONE
MODEL DC3884

TRADE NAME	Truetone MODEL DC3884
MANUFACTURER	Western Auto Supply Co., 2107 Grand Ave., Kansas City 8, Missouri
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	9 Volts DC RATING 26MA @ 9 Volts DC
TUNING RANGE—BROADCAST	535-1650KC

TRUETONE
MODEL DC3884

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna stator lug of tuning gang. Low side to chassis.	455KC (400~ Mod	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output.
2.		Loop	1650KC	"	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	540KC	Tuning gang fully closed	"	A4	"
4.		"	1400KC	Tune to 1400KC signal	"	A5	"
5.		"	600KC	600KC	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang. Repeat steps 4 and 5.

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H607

SET 421 FOLDER 15

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N168A	Converter		2N439			NPN
X2	2N292	IF Amplifier		2N439			NPN
X3	2N265	AF Amplifier		2N407	2N362	2N406	PNP
X4	2N241A	Output		2N270	2N631	2N241A	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	10	150-134	XPP-10050	NL50-10	TT10X50	ML50-15		TE-1160
C2	25	10	150-133	XPP-10025	NL25-10	TT10X25	ML30-15		TE-1118
C3	10	12	①	XPP-12010	NL10-15	TT12X10	ML10-15		TE-1128
C4	50	7	②	XPP-10050	NL50-10	TT10X50	ML50-15		TE-1160
C5	50	5	150-130	XPP-6050	NL50-6	TT6X50	ML50-6		TE-1100
C6	50	10	150-134 ③	XPP-10050	NL50-10	TT10X50	ML50-15		TE-1160

① Some versions may use 8mfd in this application (Part #150-131).
② Some versions may use 50mfd in this application (Part #150-130).
③ Not used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
C7	2000		158-114	BPD-002	DD-202	BYA10D2	DC522	5HK-D2	
C8	10000		158-113	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C9	10000		158-113	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C10	50000		158-111	BPD-05	DF-503			5HK-S5	
C11	50000		158-111	BPD-05	DF-503			5HK-S5	
C12	50000		158-111	BPD-05	DF-503			5HK-S5	
C13	50000		158-111	BPD-05	DF-503			5HK-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	10K	½	120-134	B-15	A47-10K-Z	Q13-116	U18	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			KB-1 or KR-1*	SWE-12	76-1	US-26	

* Use KR with CRL "red label" controls and KB with "blue label" controls.

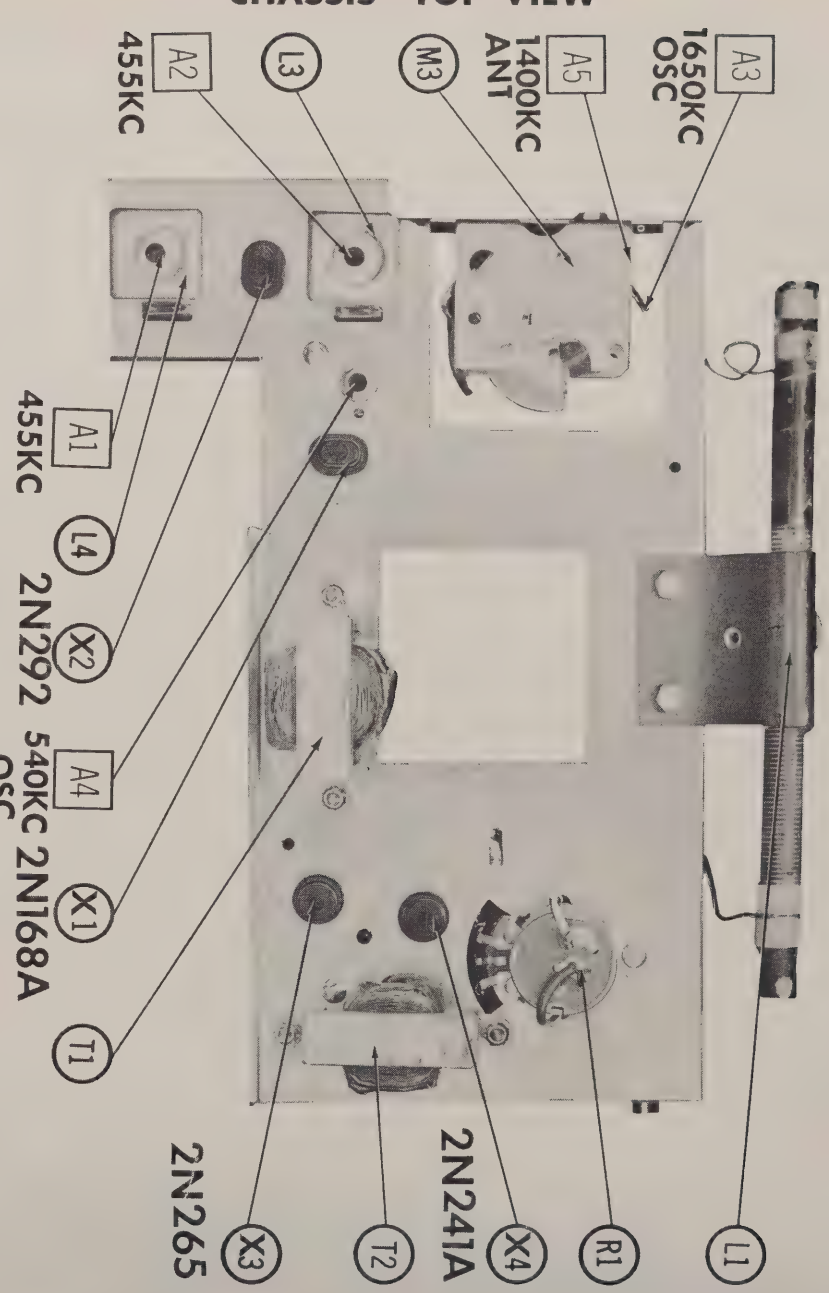
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R2	10K 5%		180-190	
R3	27K		180-193	
R4	470Ω		180-188	
R5	1500Ω		180-192	
R6	120K		180-202	
R7	12K		180-121	
R8	470Ω		180-188	

ITEM No.	RATING		TRUETONE PART No.	NOTES
	OHMS	WATT		
R9	330Ω		180-187	
R10	47K 5%		180-200	
R11	10K 5%		180-190	
R12	1000Ω 5%		180-186	
R13	1000Ω 5%		180-186	
R14	5600Ω		180-203	
R15	68Ω		180-149	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					
		TRUETONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loop Stick	132-134					
L2	Osc. Coil	136-133					
L3	Input IF	130-130					
L4	Output IF	130-130					

TRANSFORMER (INTERSTAGE)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4.7	: 1	138-121						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	650Ω	3-4Ω	138-127							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	175-129C	4A07	

BATTERIES

ITEM No.	VOLTAGE	TRUETONE PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V	3B6731		1		935		M-14	6 Used

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		TRUETONE PART No.	CBS PART No.	SYLVANIA PART No.	
M2	1N295		1N60	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Tuning Cap.	160-129	2 Gang (Ant. 23-270mmf, Osc. 23-126mmf)
M4	Jack	170-134	
	Earphone	3DW5300	Earphone

CABINETS & CABINET PARTS

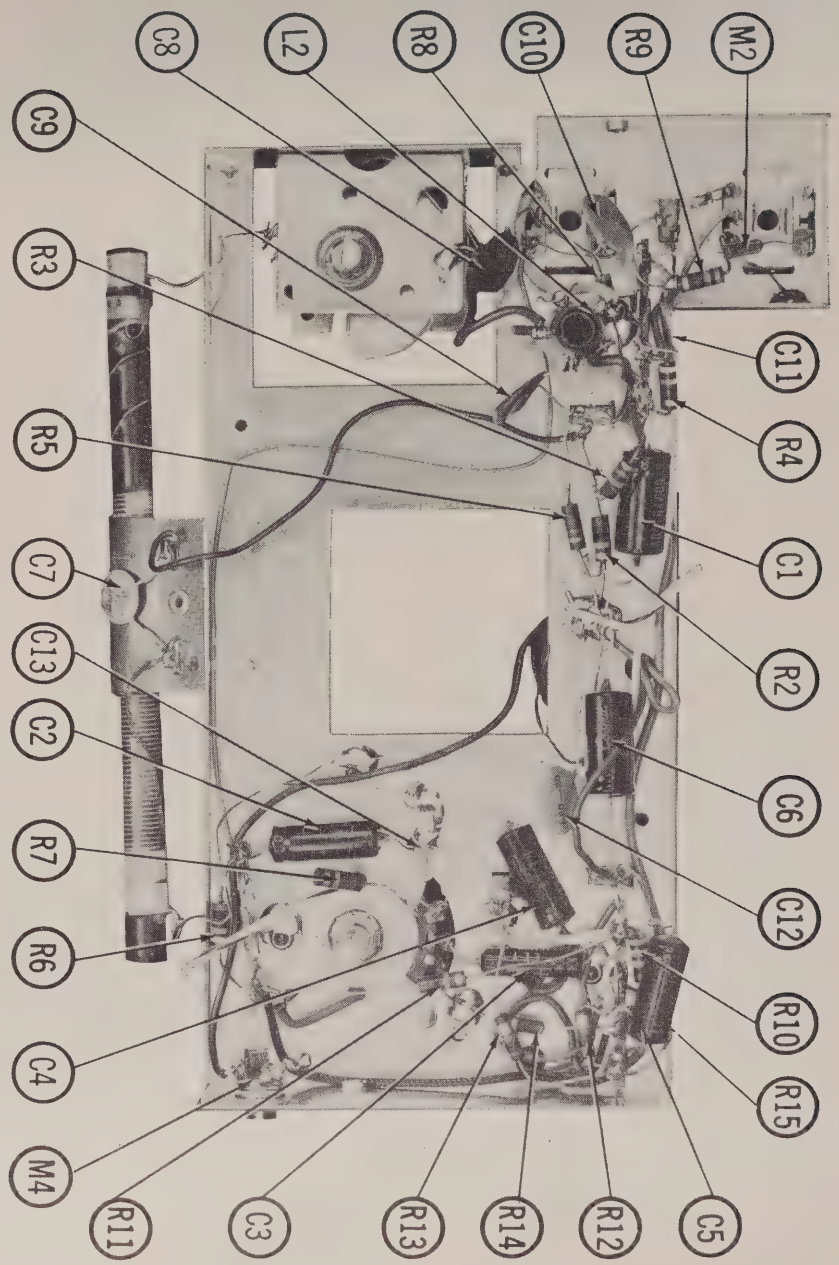
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

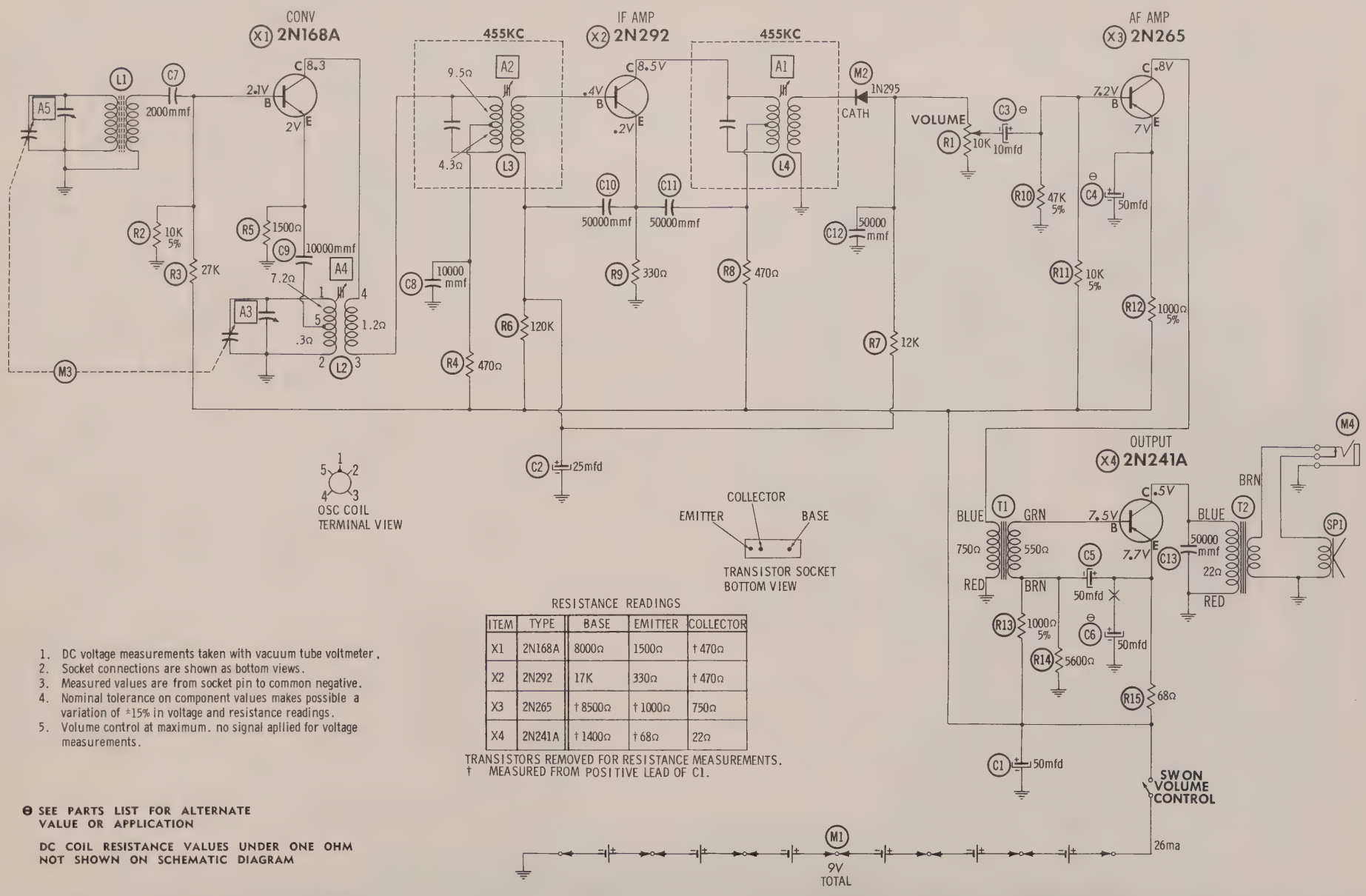
NAME	PART NO.	DESCRIPTION
Knob	220-152	Tuning, On-Off-Volume
Cabinet	210-145	
Battery Case	195-197	Bottom Section, Includes Contact Springs
Battery Case	195-196	Top Section

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N168A	8000Ω	1500Ω	†470Ω
X2	2N292	17K	330Ω	†470Ω
X3	2N265	†8500Ω	†1000Ω	750Ω
X4	2N241A	†1400Ω	†68Ω	22Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM POSITIVE LEAD OF C1.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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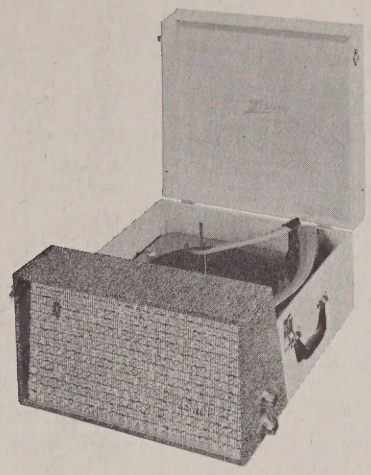
PHOTOFACT* Folder
*TRADE MARK

ZENITH
MODEL AP8J

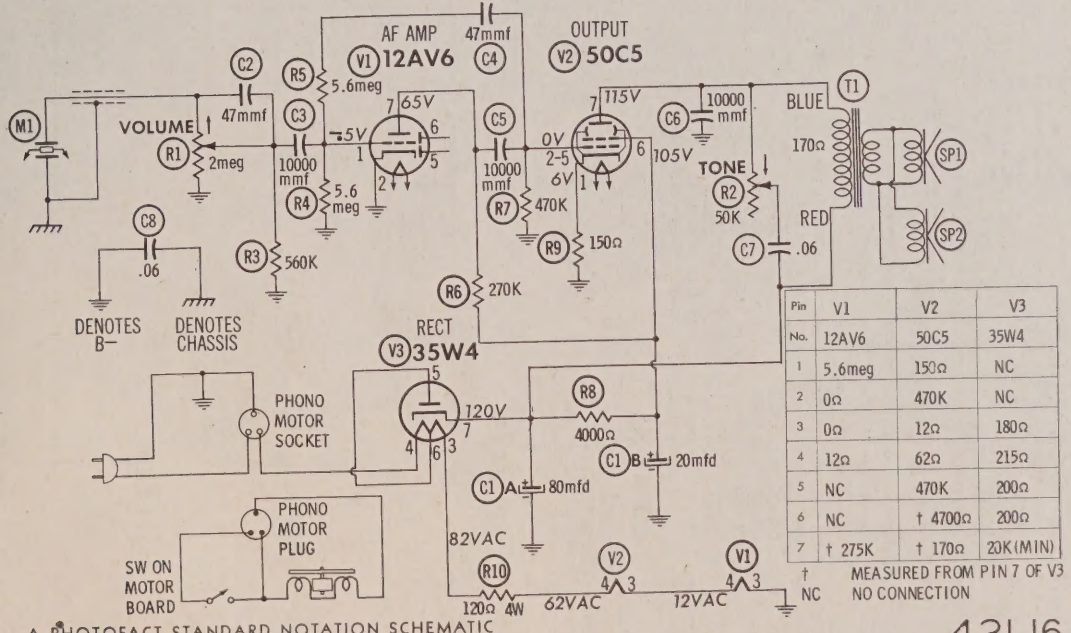
ZENITH
MODEL AP8J



TRADE NAME	Zenith Model AP8J
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AV6 AF Amplifier, 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .26 Amp. @ 117 Volts AC (25 Watts)

FOR SERVICE INFORMATION ON RECORD CHANGER #S-14081 - SEE SIMILAR ZENITH S-14078 - PHOTOFACT SET 392 - FOLDER 14.

ZENITH
MODEL AP8J



Pin No.	V1 12AV6	V2 50C5	V3 35W4
1	5.6meg	150Ω	NC
2	0Ω	470K	NC
3	0Ω	12Ω	180Ω
4	12Ω	62Ω	215Ω
5	NC	470K	200Ω
6	NC	† 4700Ω	200Ω
7	† 275K	† 170Ω	20K(MIN)

† MEASURED FROM PIN 7 OF V3
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

421-16

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AV6	
V2	Output	50C5	

ITEM No.	USE	TYPE	NOTES
V3	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	80	150	WC12018	PRS150V8020	BBRT44215	TCT3116	TDLD-10	FMD-303	TVA-2460
B	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	47		22-2466	BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C3	10000		22-1843	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C4	47		22-2466	BPD-000047	DD-470	L10Q47	UC-5447	5GA-Q47	
C5	10000		22-1843	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C6	10000		22-1843	BPD-01	DD-103	BYA10S1	DC511	5HK-S1	
C7	.06	200	22-1744	P288N-06		CUB6S6	GEM-416	6TM-S6	
C8	.06	200	22-1744	P288N-06		CUB6S6	GEM-416	6TM-S6	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ZENITH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	2meg		WC-12400					Volume
R2	50K		WC-12401					Tone

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	NOTES
R3	560K			
R4	5.6meg			
R5	5.6meg			
R6	270K			

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	NOTES
R7	470K			
R8	4700Ω			
R9	150Ω			
R10	120Ω	4		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2700Ω	1-2Ω	WC11876	Z1001 ①	A-3026 ①		A-3877 ①	24S51 ①	S-3X ①	① Drill new mounting hole.

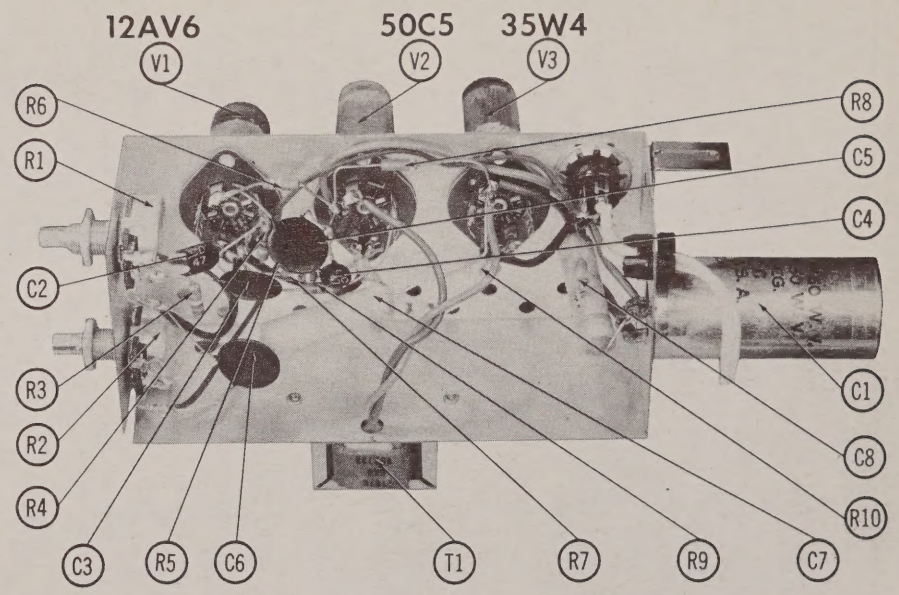
SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	WC11792	4A07	Parallel and phase.
SP2	4"	PM	3-4Ω	WC11792	4A07	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA ZENITH PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. MOUNT	REMARKS
M1		81-TB				

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA ZENITH PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2				

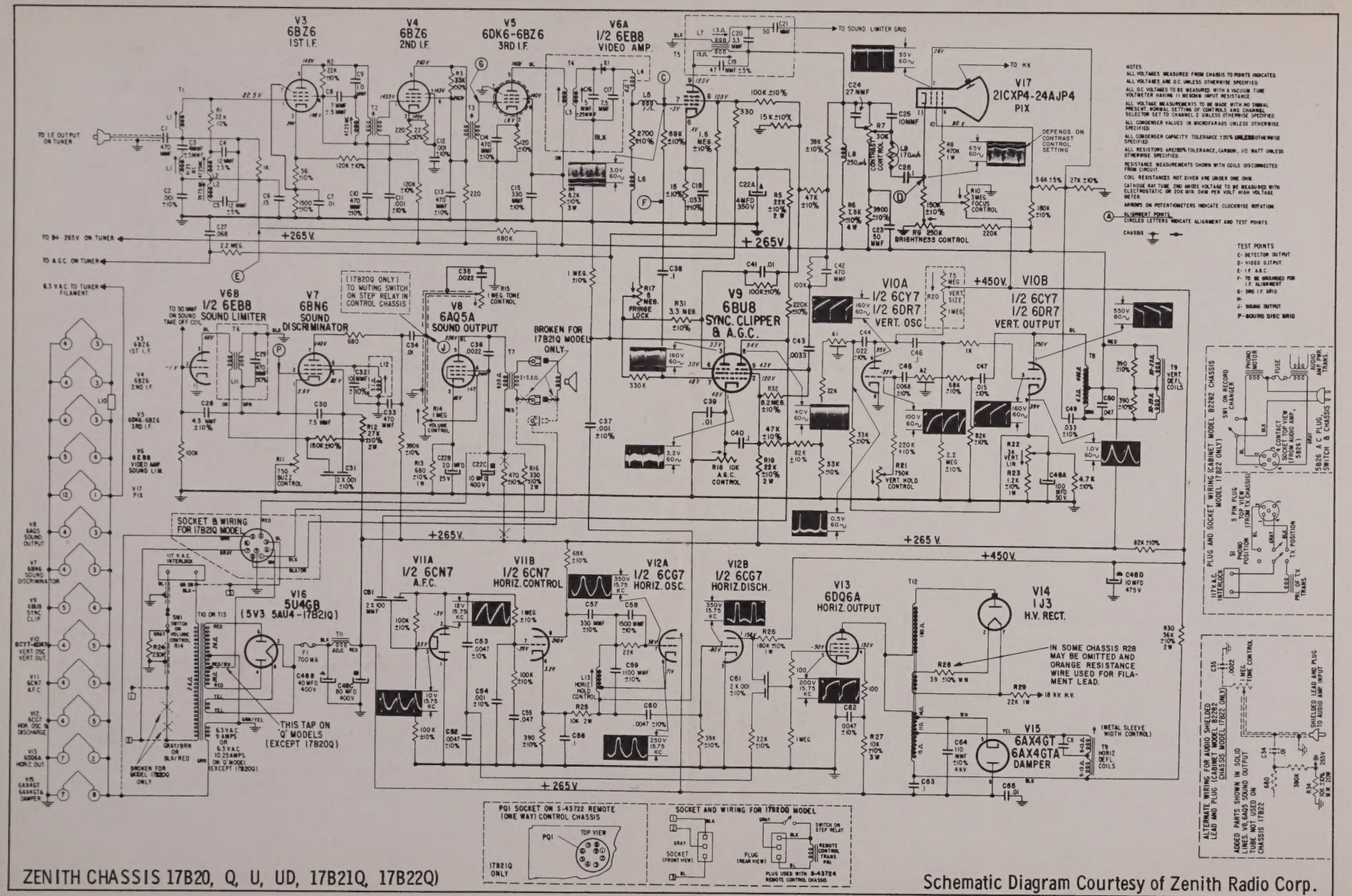
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	WC1216-1E	Volume, Tone
Case	WC12760	Includes hardware
Handle Ass'y.	WC12479-3B	
Catch	WC11837B	
Hinge	WC11836B	

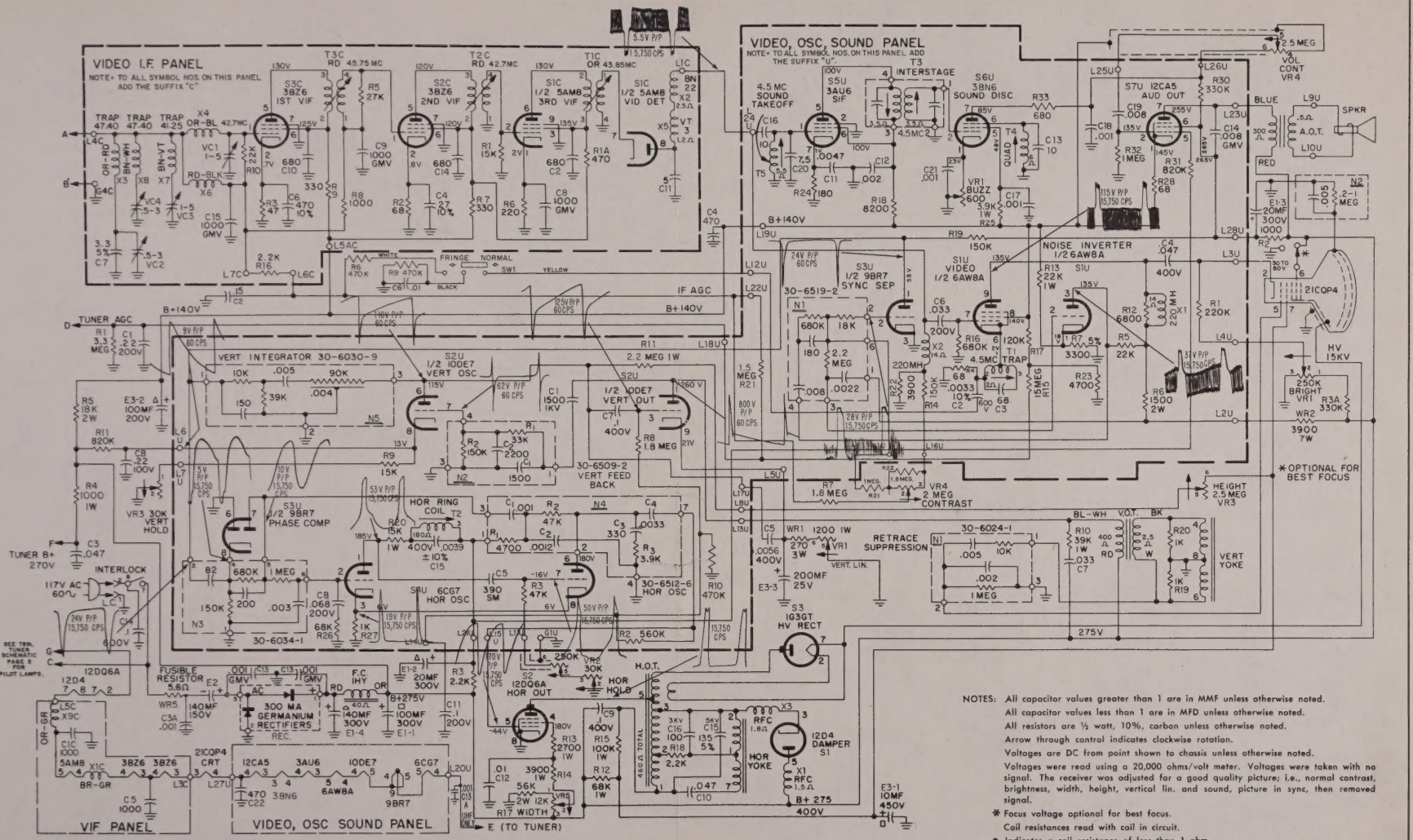
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)


V3 6BZ6 1ST I.F.
V4 6BZ6 2ND I.F.
V5 6DK6-6BZ6 3RD I.F.
V6A 1/2 6EB8 VIDEO AMP.
V17 21CXP4-24AJP4 PIX
V6B 1/2 6EB8 SOUND LIMITER
V7 6BN6 SOUND DISCRIMINATOR
V8 6AQ5A SOUND OUTPUT
V9 6BU8 SYNC. CLIPPER & A.G.C.
V10A 1/2 6CY7 1/2 6DR7 VERT. OSC
V10B 1/2 6CY7 1/2 6DR7 VERT. OUTPUT
V11A 1/2 6CN7 A.F.C.
V11B 1/2 6CN7 HORIZ. CONTROL
V12A 1/2 6CG7 HORIZ. OSC.
V12B 1/2 6CG7 HORIZ. DISCH.
V13 6DQ6A HORIZ. OUTPUT
V14 1J3 H.V. RECT.
V15 6AX4GT 6AX4GTA DAMPER
V16 5U4GB (5V3 5AU4-17B21Q)
+265 V.
+450 V.
TO I.F. OUTPUT ON TUNER
TO B+ 265V. ON TUNER
TO A.G.C. ON TUNER
6.3 V.A.C. TO TUNER FILAMENT
TO SOUND LIMITER GRID
TO H.V.
BRIGHTNESS CONTROL
CONTRAST CONTROL SETTING
FOCUS CONTROL
VOLUME CONTROL
BUZZ CONTROL
VERT. HOLD CONTROL
A.G.C. CONTROL
FRINGE LOCK
VERT. SIZE
H. LIN.
H. SIZE
H. DEFL. COILS
VERT. DEFL. COILS
(17B20Q ONLY) TO MUTING SWITCH ON STEP RELAY IN CONTROL CHASSIS
BROKEN FOR 17B21Q MODEL ONLY.
SOCKET & WIRING FOR 17B21Q MODEL
THIS TAP ON 'Q' MODELS (EXCEPT 17B20Q)
IN SOME CHASSIS R28 MAY BE OMITTED AND ORANGE RESISTANCE WIRE USED FOR FILAMENT LEAD.
(METAL SLEEVE WIDTH CONTROL)
DAMPER
PLUG AND SOCKET WIRING (CABINET MODEL B2280 CHASSIS MODEL 17B22 ONLY)
SWT. ON RECORD CHANGER
PHONO MOTOR
AUDIO AMP. PWR. TRANS.
FUSE
4 CONTACT PLUG (FROM AUDIO AMP. 5826)
5826 A.C. PLUG, SWITCH & CHASSIS
5 PIN PLUG (FROM TV CHASSIS)
S1 PHONO POSITION
TV POSITION
117 V.A.C. INTERLOCK
SW1 SWITCH ON VOLUME CONTROL R14
6.3 V.A.C. 9 AMPS OR 6.3 V.A.C. 10.25 AMPS. OR 'Q' MODEL (EXCEPT 17B20Q)
BROKEN FOR MODEL 17B20Q ONLY
ALTERNATE WIRING FOR AUDIO SHIELDED LEAD AND PLUG (CABINET MODEL B2282 CHASSIS MODEL 17B22 ONLY)
ADDED PARTS SHOWN IN SOLID LINES. V6, 6AQ5 SOUND OUTPUT AND T8 USED ON CHASSIS 17B22
TONE CONTROL
SHIELDED LEAD AND PLUG TO AUDIO AMP. INPUT
P01 SOCKET ON S-43722 REMOTE (ONE WAY) CONTROL CHASSIS
TOP VIEW
17B21Q ONLY
SOCKET AND WIRING FOR 17B20Q MODEL
SOCKET (FRONT VIEW)
PLUG (REAR VIEW)
SWITCH ON STEP RELAY
REMOTE CONTROL TRANS PRI.
PLUG USED WITH S-43724 REMOTE CONTROL CHASSIS
NOTES
ALL VOLTAGES MEASURED FROM CHASSIS TO POINTS INDICATED.
ALL VOLTAGES ARE D.C. UNLESS OTHERWISE SPECIFIED.
ALL D.C. VOLTAGES TO BE MEASURED WITH A VACUUM TUBE VOLTMETER HAVING 11 MEGOHM INPUT RESISTANCE.
ALL VOLTAGE MEASUREMENTS TO BE MADE WITH NO SIGNAL PRESENT, NORMAL SETTING OF CONTROLS AND CHANNEL SELECTOR SET TO CHANNEL 2 UNLESS OTHERWISE SPECIFIED.
ALL CONDENSER VALUES IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
ALL CONDENSER CAPACITY TOLERANCE ±20% UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS ARE ±10% TOLERANCE, CARBON, 1/2 WATT UNLESS OTHERWISE SPECIFIED.
RESISTANCE MEASUREMENTS SHOWN WITH COILS DISCONNECTED FROM CIRCUIT.
COIL RESISTANCES NOT GIVEN ARE UNDER ONE OHM.
CATHODE RAY TUBE 2ND ANODE VOLTAGE TO BE MEASURED WITH ELECTROSTATIC OR 20K MIN. OHM PER VOLT HIGH VOLTAGE METER.
ARROWS ON POTENTIOMETERS INDICATE CLOCKWISE ROTATION
ALIGNMENT POINTS. CIRCLED LETTERS INDICATE ALIGNMENT AND TEST POINTS.
CHASSIS
TEST POINTS
C- DETECTOR OUTPUT
D- VIDEO OUTPUT
E- I.F. A.G.C.
F- TO BE GROUNDED FOR I.F. ALIGNMENT
G- 3RD I.F. GRID
J- SOUND OUTPUT
P- BOUND DISC GRID

ZENITH CHASSIS 17B20, Q, U, UD, 17B21Q, 17B22Q)

Schematic Diagram Courtesy of Zenith Radio Corp.



NOTES: All capacitor values greater than 1 are in MMF unless otherwise noted.
All capacitor values less than 1 are in MFD unless otherwise noted.
All resistors are ½ watt, 10%, carbon unless otherwise noted.
Arrow through control indicates clockwise rotation.
Voltages are DC from point shown to chassis unless otherwise noted.
Voltages were read using a 20,000 ohms/volt meter. Voltages were taken with no signal. The receiver was adjusted for a good quality picture; i.e., normal contrast, brightness, width, height, vertical lin. and sound, picture in sync, then removed signal.
* Focus voltage optional for best focus.
Coil resistances read with coil in circuit.
• Indicates a coil resistance of less than 1 ohm.

PHILCO MODELS G4231E, L, G4234S, SL, SM, G4640L, W, G4660, UG4231E, L, UG4234S, SL, SM, UG4640L, W, UG4660 (Chassis 9L35, U)

Schematic Diagram Courtesy of Philco Corp.

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